UNIVERSITY *of* SANTA CLARA

CATALOGUE FOR THE
SEVENTY-EIGHTH YEAR
1928-1929

ANNOUNCEMENTS 1929-1930

University of Santa Clara

COLLEGE OF LIBERAL ARTS

Courses in Letters, Philosophy, Science, and Education leading to the Bachelor's degree.

GRADUATE DEPARTMENT

Courses leading to the higher degrees.

COLLEGE OF BUSINESS ADMINISTRATION

A four year course leading to the degree of Bachelor of Commercial Science.

COLLEGE OF ENGINEERING

Courses in Chemical, Civil, Mechanical, and Electrical Engineering leading to Professional Degrees.

COLLEGE OF LAW

A four-year course leading to the degree of Bachelor of Laws, following the pre-legal work in the College of Liberal Arts.

PREMEDICAL DEPARTMENT

A standard three-year course preparatory to Medicine meeting the requirements of the American Medical Association.

PRE-DENTAL DEPARTMENT

A two-year course preparatory to Dentistry.

THE OBSERVATORY

Astronomical, Meteorological and Seismological Observatory.

For Catalogue of the University or Bulletins of the Colleges
Address
THE REGISTRAR
University of Santa Clara, Santa Clara, California

University of Santa Clara

CATALOGUE

FOR THE SEVENTY-EIGHTH YEAR

1928-1929

ANNOUNCEMENTS 1929-1930

To mould men after the model of the Man-God, and thus to form them to serve their fellowmen, their country and their God; this is the ideal and the purpose of the University of Santa Clara.

PUBLISHED BY THE UNIVERSITY OF SANTA CLARA
SANTA CLARA, CALIFORNIA
MARCH, 1929

Acc 84-20

TABLE OF CONTENTS

Board of Trustees 1
Calendar 2
Officers of Administration and Instruction.... 4
Faculty Committees 7
General Information 8
- Location — History 8
- System of Education 10
- Grounds and Buildings 10
- Endowment — Scholarships 13
- Student Organizations 14
- Expenses 18
- Scholarships — Prizes 20
- Admission to the University 22
- Discipline 26
- Scholarship Requirements 28
- Graduate Department 34

College of Liberal Arts 37
- General Information 41
- Description of Courses 46

College of Business Administration 69
- General Information 71
- Description of Courses 75

College of Engineering 85
- General Information 86
- Description of Courses 96

College of Law 117
- Faculty 118
- General Information 119
- Description of Courses 123

Premedical Department 125
Pre-Dental Department 125
Observatory 131
Jesuit Junior College & Seminary 133
Degrees Conferred, 1928 138
Extraordinary Prizes Awarded, 1928 140
Donations and Benefactions 142
Register of Students—1928-1929 145

The Corporate Title of the University is

THE PRESIDENT AND BOARD OF TRUSTEES OF SANTA CLARA COLLEGE

BOARD OF TRUSTEES

CORNELIUS JOSEPH McCOY
President

JOHN JOSEPH HAYES
Secretary and Treasurer

ALOYSIUS VINCENT RAGGIO

JEROME SIXTUS RICARD

JOSEPH MATTHEW GEORGEN

WILLIAM CHARLES GIANERA

CLARENCE C. COOLIDGE, Esq.

EXECUTIVE BOARD

THE PRESIDENT THE SECRETARY

CLARENCE C. COOLIDGE, Esq.

CONSULTING ATTORNEY

CLARENCE C. COOLIDGE, Esq.

CALENDAR

First Semester—1929

August 15-19	Registration.
August 15 & 16, Thur. & Fri.	Registration of non-resident students.
August 17 & 18, Sat. & Sun.	Registration of new resident students.
August 19, Monday	Registration of old resident students.
August 17, Saturday	Dormitories open to resident students. Dining room open at noon.
August 19, Monday	Instruction begins at 1:30 p. m.
August 24, Saturday	Examinations to remove conditions.
August 28, Wednesday	Mass of the Holy Ghost.
September 2, Monday	Registration closes in all departments.
September 3, Tuesday	Students' Retreat begins at 6:30 p. m.
September 7, Saturday	Students' Retreat ends.
September 9, Monday	Admission Day; a holiday.
November 1, Friday	All Saints' Day; a holiday.
November 8, Friday	Requiem Mass for deceased members of Faculty and Alumni.
November 28, Thursday	Thanksgiving Day; a holiday.
December 2, Monday	Repetitions begin.
December 4, Wednesday	Dramatic Art Contest.
December 20, Friday	Christmas recess begins at 3:30 p. m.

Second Semester—1930

January 6, Monday	Christmas recess ends at 6:00 p. m. Second semester begins.
January 7, Tuesday	Classes begin in all departments.
January 11, Saturday	Examinations to remove conditions.
January 20, Monday	Registration closes in all departments.
January 25, Saturday	Last day to submit subjects for Graduation Theses and Junior Certificate essays.
February 22, Saturday	Washington's Birthday.
March 1, Saturday	Last day to submit plays for the Leahy Prizes.
March 8, Saturday	Last day to submit historical essays for the Redwood Prize.
March 22, Saturday	Last day to submit short stories for the McCann Prize.
April 9, Wednesday	Oratorical Contest for the Owl Prize.
April 10, Thursday	Contest for the Archbishop's Medal for Christian Doctrine.
April 16, Wednesday	Easter recess begins at 3:30 p. m.
April 22, Tuesday	Easter recess ends at 6:00 p. m.
April 25, Friday	Last day to submit graduation theses and Junior Certificate Essays. Last day to submit scientific essays for the Orella Prize.
April 30, Wednesday	Ryland Debate.
May 1, Thursday	Repetitions begin.
May 5, Monday	Written examinations for Seniors begin, followed by orals.
May 8, Thursday	General examinations begin.
May 17, Saturday	Baccalaureate Mass and Sermon. Seventy-ninth Annual Commencement.

OFFICERS OF ADMINISTRATION AND INSTRUCTION

CORNELIUS JOSEPH McCOY, S. J., A. M.
President

JOSEPH MATTHEW GEORGEN, S. J., A. M.
Vice-President, Director of Discipline

WILLIAM CHARLES GIANERA, S. J., A. M.
Dean of the Faculties, Director of Studies, Registrar

CLARENCE C. COOLIDGE, B. S., A. B., J. D.
Dean of the College of Law
Equity, Constitutional Law

GEORGE LEONARD SULLIVAN, B. S., M. E., Ph. D.
Dean of the College of Engineering
Mechanical-Electrical Engineering

WILLIAM HENRY PABST
Dean of the College of Business Administration

EDWARD JOHN KELLY, B. S., C. P. A.
Acting Dean of the College of Business Administration
Accounting, Mathematics of Investment, Auditing

JOHN PETER MOOTZ, S. J., A. M.
Dean of Men
Ethics, Religion

EDWARD ALEXANDER AMARAL, M. D.
Visiting Physician

HUNTER S. ARMSTRONG, A. B., LL. B.
Prouerty, Criminal Law & Procedure, Partnership

EUGENE MICHAEL BACIGALUPI, S. J., A. M., Ph. D.
Physics

EDWARD RICHARD BOLAND, S. J., A. M.
History, Religion

JOSEPH BOLAND, B. S.
Assistant in Football

JOHN MAY BURNETT, A. B., LL. B.
Code Pleading, Torts

ALBERT MICHAEL CASEY, S. J., A. M.
Psychology, Principles of Education

ARTHUR VINCENT COGHLAN, S. J., A. M.
Logic, Religion

LAWRENCE H. COOK, A. M.
Organic Chemistry

RAYMOND FRANK COPELAND, S. J., A. M.
Latin, Logic

† CORNELIUS FRANCIS DEENEY, S. J., A. M., Ph. D.
Political Science, Logic

CAMILLO d'ABRUZZO, Brev. Sup. (Sorbonne, Paris)
Italian

COL. JOSEPH L. DONOVAN, U. S. A. (retired)
Dean Emeritus, College of Engineering
Special Lecturer in Civil Engineering

JAMES DUFFY, S. J., A. M.
Biology

HARLAN H. DYKES, A. B., LL. B.
Director of Physical Education, Basketball
Elementary Law

EDWARD MARTIN FELLOWS
Domestic Relations, Common Law Pleading

JUSTIN FITZGERALD
Director of Baseball

FREDERICK C. GERLACH, B. S., M. S., M. D., LL. D.
Visiting Physician and Surgeon

JOHN JOSEPH HAYES, S. J., A. M.
Secretary and Treasurer

JAMES BERNARD HENRY, S. J., A. M.
Engineering Mathematics, Mechanical Drawing, Seismology

BERNARD ROSECRANS HUBBARD, S. J., A. M.
Geology, German

EUGENE M. IVANCOVICH, S. J., A. M.
Superintendent of Grounds and Buildings

HENRI LECAT, Brev. Sup. (Paris)
French

ALLAN PETER LINDSAY, A. B.
Bailments & Carriers, Negotiable Instruments

WILLIAM DIRVIN LOTZ, B. S., C. E.
Civil Engineering

JAMES PHILIP LOVELY, M. D.
Biology

† On leave of absence during the year 1928-29.

JAMES J. LYONS, S. J., A. M.
English, Religion
RALPH HENRY MARTIN
Assistant to the Dean of the Faculties
Spanish
EDWARD M. MENAGER, S. J., A. M.
Chemistry, Biology
PETER FRANCIS MORETTINI, A. B., LL. B.
Commercial Law, Court Practice
EDWARD PRESTON MURPHY, A. B., LL. B.
Dramatics, Public Speaking, Business Law
LEONARD JOSEPH NEUMAN, B. S., M. S.
Electrical Engineering, Mathematics
ALBERT J. NEWLIN, B. S., LL. B., J. D.
Associate in Meteorology and Seismology
MARK D. NOLL, B. B. A.
Money & Banking, Marketing
JEROME SIXTUS RICARD, S. J., A. M.
Astronomy, Meteorology
* EDMUND JOSEPH RYAN, S. J., A. M.
Field Secretary, Moderator of the Alumni Association
FRED C. SAUER, A. B.
Finance, Statistics, Business Cycles
EDWARD SHIPSEY, S. J., A. M.
English, History of Education
CHARLES DANIEL SOUTH, A. M., Litt. D.
Assistant Librarian
RONALD GRANT STEWART, A. B., J. D.
Agency, Damages
IVOR EDGAR WALLIS, LL. B.
Contracts and Sales
ADAM WALSH
Director of Football
ERNEST PAUL WATSON, S. J., A. M.
Spanish, Religion
† GEORGE KENNETH WHITESIDE, A. B.
Business Administration
HENRY WOODS, S. J., Ph. D.
Emeritus Professor of Ethics, Librarian

* Deceased December 5, 1928.

† On leave of absence during the year 1928-29.

FACULTY COMMITTEES

ATTENDANCE—The Director of Studies and the Director of Discipline.

CREDENTIALS AND REGISTRATION—The Director of Studies, the Deans of the various Colleges, and the Director of Discipline.

DISCIPLINE—The Director of Discipline and the Director of Studies.

DRAMATICS AND PUBLIC EXERCISES—The President, the Director of Studies, the Director of Discipline, and the Director of Dramatics.

EXAMINATIONS—The President, the Director of Studies, and the Professors of the various courses.

POST-GRADUATE STUDIES—The President, the Director of Studies and the Professors of the subjects in which the Post-Graduate work is taken.

SCHOLARSHIP AND STANDING—The Director of Studies and the Deans of the several Colleges.

STUDENT PUBLICATIONS—The Director of Studies, the Director of Discipline and the Faculty Moderator.

STUDENT ORGANIZATIONS—The Director of Studies, the Director of Discipline and the Director of each organization.

THESES—The Director of Studies and the Professors of the Upper Division Courses.

ATHLETICS—**Board of Athletic Control.** The President, a member of the faculty chosen by the President, and three members of the Alumni Association also chosen by the President.

Advisory Board of Athletics. Five members of the Alumni Association.

Auxiliary Athletic Board. A member of the faculty and three members of Associated Students appointed by the President.

GENERAL INFORMATION

LOCATION

The University of Santa Clara, conducted by the Jesuit Fathers, is situated at Santa Clara on the site of the old Mission, in the southern part of the San Francisco metropolitan district and immediately adjacent to San Jose. Frequent railroad, street-car and bus service provides easy access to the various Bay cities, and direct connections to all parts of California and the west.

The valley of Santa Clara is famous throughout the world for the beauty of its scenery, the salubrity of its climate, and the excellence of its fruits. The climate is mild and equable both in summer and winter, and on that account singularly favorable for persistent study and research as well as for the maximum of agreeable out-of-doors recreation which such work makes necessary.

HISTORY

Mission Santa Clara. On January 12, 1777, two Franciscan Padres, de la Pena and Murguia, planted the Mission Cross and laid the foundations of Mission Santa Clara on the banks of the Guadalupe, about a mile and a half from the University grounds. Two years later a flood destroyed both church and monastery, and the Padres in consequence removed the Mission to the second site, two blocks from the present church. There, on November 9, 1781, they laid the foundation of a large adobe church and mission buildings. Three years later, on May 15, 1784, the new church was dedicated by the Venerable Padre Serra, then Padre Presidente of the Missions of California.

Owing to damage by earthquakes in 1812 and 1818 the Padres were forced to build anew and this time selected the site of the present Mission. There, on August 11, 1822, a still larger church was dedicated. With the passing of time the original church was largely rebuilt, though the chancel and the interior arrangements remained substantially as originally constructed.

In 1836 Mission Santa Clara was secularized and passed from the hand of the devoted Padres into those of politicians, who robbed the Mission of her lands and oppressed or drove away her children. When Rt. Rev. Joseph Sadoc Alemany, O. P., arrived as Bishop of the Diocese of San Francisco in 1850, he found only one Franciscan in charge of the Mission, which had been restored by the American

government, though in a sadly reduced form.

Santa Clara College. Desiring to save the remnants of the Mission, and also to start a college to meet the growing need of the times, the Bishop invited the Society of Jesus to Santa Clara. The invitation was accepted, and accordingly on March 19, 1851, Father John Nobili laid the foundation of Santa Clara College.

He adapted the old adobe buildings to the requirements of a college. On April 28, 1855, the institution was chartered a University and continued to be known as Santa Clara College until 1912, making it the oldest institution of higher learning in the west. In 1857 the degree of A. B. was conferred on Thomas I. Bergin, the first to receive that degree in a California college.

During the subsequent years the College grew in influence and attendance. Several large new buildings were added, and for many years Santa Clara College, in both equipment and scholastic standing, ranked as the leading educational institution in the west. In its sixty years of existence as a college over seven thousand students were matriculated, and nearly five thousand were graduated.

The University. In 1907 lectures were commenced with a view of preparing students to enter upon the professional courses in law, medicine and engineering. In 1911, the pre-medical course was established and the law school begun. Realizing, therefore, that the College was practically doing the work of a University, the President, Father James P. Morrissey, S. J., and the Board of Trustees adopted officially the name of "The University of Santa Clara", this decision going into effect on April 29, 1912.

In the summer of 1912, engineers of high standing were engaged to carry on the courses in engineering, and in the next summer a thoroughly equipped laboratory for engineering was prepared. In the same year the amount of work required of law students was increased and the classes in Law were thenceforth held at night.

The outbreak of the War suspended the plans for expansion and it was not until after its close that they were resumed. In 1923 an extensive building program was commenced, with a view to provide an adequate material basis for the University, and during the following years there has been added a group of new buildings, including Alumni Science Hall, 1923; Montgomery Laboratories, Seifert Gymnasium, Kenna Hall and the Service Building, 1924; Donohoe Infirmary, 1925; the remodeling of the Auditorium in 1926; the Ricard Memorial Observatory, the Seismological and Meteorological Stations, and the New Mission Church in 1928, and the authorization of the University Library, Nobili Hall.

Accompanying the Building Program there has come a corresponding growth in attendance and scholastic work. In 1923 the Pre-Medical course was restored, and a four years College of Business Administration added. In 1925 the Institute of Law was increased to four years; steps taken towards the establishment of a School of Education; and the Preparatory Department transferred to a separate campus on the former property of the College of the Pacific at College Park, San Jose. In 1926 the University celebrated its Diamond Jubilee and with enlarged facilities and equipment has entered upon a program of greater service to Church and state.

SYSTEM OF EDUCATION

The Jesuit system of education aims at developing side by side the moral and intellectual faculties of the student, at sending forth to the world men of sound judgment, of acute and rounded intellect, of upright and manly conscience. And since men are not made better citizens by the mere acquisition of knowledge, without a guiding and controlling force, the principal faculties to be developed are the moral faculties. Moreover, morality is to be taught continuously. It must be the underlying base, the vital force supporting and animating the whole organic structure of education. It must be the atmosphere the student breathes. It must suffuse with its light all that he reads, illuminating what is noble and exposing what is base, giving to the true and false their relative light and shade.

Because of its conservative system of education, its solid philosophical system and the highly specialized training required of those who qualify as professors, the University of Santa Clara is particularly prepared to train leaders of men.

Though the Catholic Religion is the Religion professed by the Faculty and by the larger number of the students, members of all religions are admitted provided they are willing for the sake of order and uniformity to conform respectfully to the religious observance of the University.

GROUNDS AND BUILDINGS

The Campus. The University occupies a well laid out campus of approximately fifteen acres facing the Alameda, on El Camino Real from San Francisco to Los Angeles—the site of the third Mission Santa Clara. The buildings are grouped in a series of quadrangles around the Mission church in accordance with the Campus Plan prepared by Mr. John J. Donovan, which provides for a continuation of the original Mission style.

Mission Santa Clara, built in 1822, and the Students' Chapel, built in 1887, were destroyed by fire on October 25, 1926. Through the generosity of Alumni and friends of the University, a new Mission Church, a replica of the original church, stands on the former site, the heart and center of University activities. It will serve as the Students' Chapel and at the same time enshrine the priceless relics of the old Mission rescued from the fire by the heroic efforts of the Faculty and students.

Bergin Hall, built in 1912 to replace the old Fathers' Building destroyed by fire in 1909, is a gift to Alma Mater of her first graduate, Hon. Thomas I. Bergin, A. B. '57. It contains the administrative offices of the University, reception rooms, residence of the Fathers and Scholastics, and the Library.

O'Connor Hall, built in 1912, is the gift of Mr. and Mrs. Myles P. O'Connor. On the first floor are the class-rooms of the College of Liberal Arts and of the Institute of Law, and office of the Director of Discipline. The second and third floors contain private rooms for the upper class-men. In the basement are the co-operative bookstore, restaurant, and recreational facilities of the Associated Students, Practice Court of the Institute of Law, and the Paleontological Museum.

The Theater, originally built in 1870 and completely reconstructed in 1926, is one of the largest theaters for amateur productions in the West, and has been the scene of such notable dramatic productions as the Passion Play and the Mission Play of Santa Clara.

Alumni Science Hall, built in 1924, is the gift of the Alumni of Santa Clara and contains offices, class-rooms, laboratories, and drawing rooms of the College of Engineering; the lecture rooms and laboratories of the Departments of Biology, Chemistry and Physics; and the electrical equipment service rooms.

Robert E. Kenna Hall, erected in 1924, is dedicated to Rev. Robert Emmet Kenna, S. J., student, professor and twice president of Santa Clara College. On the first floor are the offices, class-rooms, laboratories and library of the College of Business Administration; and class rooms for the lower division classes. The two upper floors contain private rooms for the lower division students.

Montgomery Laboratories, erected in 1924, are dedicated to John J. Montgomery, "Father of Aviation", one time professor of Physics. It contains the forge, wood-working and pattern-making, materials testing, mechanical, and electrical laboratories of the College of Engineering, together with office, class room and lockers for laboratory classes.

Seifert Gymnasium, erected in 1924, is a bequest of the late Dr.

George W. Seifert, B. S. '79. It houses the plunge (40x100x10), the basketball court (65x100), locker rooms for Varsity and class teams, music rooms and students' lounging room, and is the center of social life at the University.

The Service Building, erected in 1924, houses the laundry, power and heating plant, and service rooms. The second floor provides a dormitory for employees

Donohoe Infirmary, erected in 1925, is the gift of Miss Katherine Donohoe in memory of her father and mother, James and Rose Donohoe. It is a complete small hospital, with private rooms and ward, diet kitchen, dispensary, operating room, chapel, and offices for the infirmarian and visiting physician.

The Refectory Building, a continuation and wing of the original Mission, has been remodeled to serve as the Refectory. On the first floor are the refectories for the students, Fathers, guests, faculty and employees; kitchens; and service rooms.

The Ricard Memorial Observatory is the gift of the Knights of Columbus to the "Padre of the Rains". This building, with its three domes, houses the telescopes, the spectroheliograph and other instruments which have been provided to assist Father Ricard in his study of the sun-spots. An underground passageway connects the vault of the Seismic Station to the Observatory. The new Seismic Station contains the old 80Kg Wiechert Horizontal and Vertical Seismographs, three new Galitizin Seismographs of the long range type and the two new Wood-Anderson Seismographs, especially designed for local quakes. A specially constructed clock niche in the vault will contain a "Shortt Synchronome Clock" and will be kept at a constant temperature by means of a highly sensitive thermostatic control. The Observatory likewise houses the other necessities of a Station of this type, such as Battery rooms, photographic dark-rooms and offices where records will be kept for study and reference.

The Library: Nobili Hall. Authorization has been given and plans prepared for the first wing of the new Nobili Hall, named in honor of Father John Nobili, S. J., the first president, to house the University Library. Construction has been delayed owing to lack of funds. In it stack room will be provided for 150,000 volumes, allowing for expansion; the main reading room with its mezzanine reference alcoves will afford simultaneous accommodations for two hundred readers; the Faculty will have its own study room, while the periodicals will be found in another section off the main reading room.

An added unique feature will be a whole floor devoted to the many rare books possessed by the University dealing not only with

literature, divinity and science, but also with the earlier history of California, and which have been treasured from Mission days.

Athletic Field. Adjacent to the campus is the Athletic Field, with football and baseball fields. Adjoining the Gymnasium are tennis and handball courts.

LABORATORIES

The laboratories of the departments of Biology, Chemistry and Physics are located on the first and third floors of the Alumni Science Hall. They are completely equipped for lower division laboratory work and a limited amount of advanced work.

The laboratories of the College of Engineering are located in Alumni Science Hall and in the Montgomery Laboratories and provide complete laboratory facilities for engineering courses.

The Astronomical, Seismological and Meteorological laboratories are located in the Observatory group.

LIBRARY FACILITIES

The Library of the University is situated in the Administration Building, and is especially rich in reference works in classical and modern literature, in historical, scientific and philosophical subjects. The Law Library is housed in O'Connor Hall. In all the colleges of the University there are handy departmental libraries containing books for immediate reference. In all, the libraries of the University contain about 59,000 volumes.

ENDOWMENT AND NEW BUILDINGS

The growth in the number of students and the work of the University has made it imperative that adequate buildings and endowment be provided. For this, and in order that Santa Clara may widen its scope as an educational institution of recognized standing, funds are necessary. Santa Clara stands in imperative need of an endowment. The work the University has accomplished in the past is an earnest of what she will do when increased facilities are afforded her.

An endowment, however, implies a founder or founders and benefactors. During the past few years, many have helped the University and generous donations have been made. The new Misssion Church, the Donohoe Infirmary, Bergin, O'Connor, and Alumni Science Halls, Seifert Gymnasium and Ricard Memorial Observatory are inspiring examples of such support.

But before other buildings, for which the plans of the University provide, may be added, further benefactions will be needed. Other institutions, even those state-aided and richly endowed, receive generous assistance in their work and hesitate not to ask for it. Santa

Clara feels that generous friends are not lacking, though for the want of deeper thought on the matter, few realize the importance of Christian educational work, the immense sacrifice it entails, and the merit there is in co-operating and sharing with Christian educators in their work for God and country and the welfare of the young men of our generation.

The Jesuit Faculty of the University has given its life-services freely and gladly to the work. Those who would share with them in this great enterprise can do so most effectively by rendering material aid and contributing funds for the continuance and development of the work.

FORM OF BEQUEST

I give and bequeath unto the President and the Board of Trustees of Santa Clara College, a corporation duly incorporated under the laws of the State of California, a sum of.....dollars.

SCHOLARSHIPS

Every year deserving young men of high character and aspirations, whose means do not permit their attending the University, appeal to the Faculty for assistance to obtain the education for which their talents and vocation fit them. There is scarcely a university in the United States which is not provided with a fund for this purpose, and a relatively large percent of successful college men spring from the class of assisted students. To contribute to such a purpose is clearly a noble benefaction. But this is especially so with regard to those who apply for help to the University of Santa Clara. They are as a rule young men of high standing, who understand the paramount value of an education in a university which aims at the highest intellectual development of the student, while devoting no less attention to the perfect development of his moral character. As a consequence, to assist them in attaining their desire is to aid picked young men whose future is more than ordinarily full of promise, and who are destined to exert a most powerful influence on those among whom their lives will be spent.

Through the generosity of friends of the University a few such scholarships have recently been established, but there is need for many additional scholarships, either through permanent endowment or by annual gifts.

STUDENT ORGANIZATIONS

College life must include the development of the social side of

every student's character. Marked initiative and leadership in organized religious and social movements for the common welfare of his fellows, are qualities expected of college men generally. For this purpose the University student organizations and activities furnish splendid opportunity.

RELIGIOUS ACTIVITIES

As the first thought of the University is the encouragement of a sound religious life on the part of the student body, special attention is given to those sodalities and religious organizations sponsored by the Church, some of which have existed at Santa Clara for nearly three quarters of a century.

Sodality of the Immaculate Conception. Its object is to promote in its members a special and filial devotion to the Immaculate Mother of God, to imitate her virtues, to encourage, both by word and example, an eminent purity of morals and a manly fidelity to the practice of religion.

The League of the Sacred Heart. The object of this Association is to foster in the students an earnest religious spirit, particularly a deep and tender love towards our Lord in the Sacrament of His Love, and a consequent reparation for the offenses committed against Him. To this end the First Friday Communion is zealously encouraged.

The Saint John Berchmans' Sanctuary Society. This society has as members those students who as a reward for good conduct and exact application to their studies have been allowed to serve at Mass and assist at the other services in the College chapel.

Holy Name Society. The purpose of this society is the public manifestation of belief in the Divinity of our Lord Jesus Christ.

DRAMATICS

An exceptionally high standard of dramatics has been set at Santa Clara from the beginning. Earliest records show that classical productions were quite the accepted thing even in the fifties, nor have traditions changed. In consequence of this students acquire a rare facility of expression and unusual ease in public appearances.

Each year a major dramatic production is staged, giving opportunity to a large proportion of the student body to participate. In the past these productions have included such notable performances as "The Mission Play of Santa Clara" and "The Light Eternal" by Martin V. Merle '06, and "The Passion Play of Santa Clara", and "The Weaver of Tarsus" by Clay M. Greene '69.

DEBATING

The standard of debating is on a par with that of dramatics. In addition to the various debating societies inter-collegiate debates are

arranged each year with representative colleges and universitiies.

The Literary Congress held its first meeting on February 22, 1857, and has since then furnished its members an opportunity for exercise in debating and other forms of public speaking. It consists of two Houses, the Senate and the House of Philhistorians.

The Stephen M. White Debating Society, established October 14, 1922, has for its object the fostering of debating and public speaking among Freshmen in the College of Liberal Arts.

MUSIC

The University Band and Orchestra furnish their members with the opportunity for ensemble playing at the public exercises of the University.

The University Choir and Glee Club furnish vocal music for Chapel services and the public exercises of the University.

ATHLETICS

Athletics at Santa Clara are under faculty control through the Board of Athletic Control and the Faculty Moderator, by whom arrangements for inter-collegiate and intra-mural contests are made.

In direct charge of Athletics and Physical Training is the Director of Physical Education, who is assisted by professional coaches in the various major activities.

Block S. C. Society. Members of the University teams who have secured the University letter are organized into the Block S. C. Society in recognition of their athletic ability and for the encouragement of a high standard of athletic conduct.

The Athletic Managers Association is composed of volunteers from each class who cooperate with the management in the conduct of games and the care of equipment.

ALUMNI ASSOCIATION

The object of this association is to strengthen and perpetuate college friendships, to preserve in former students a warm regard for Alma Mater and a lively memory of the substantial benefits she has bestowed, to cherish and advance her interests, to maintain her honor and sustain her reputation by manly and honorable conduct. Officers of the Association for 1928 are:

Roy A. Bronson, A. M. '13, LL. B. '14, President
Adolph B. Canelo, A. B. '15, LL. B. '16, J. D. '28, Vice-President
Charles H. Graham, A. B. '98, Vice-President
Louis O. Normadin, A. B. '03, Vice-President
Danilo Tadich, A. B. '11, Secretary
John T. Irilarry, A. B. '11, Treasurer

PUBLICATIONS

The Santa Clara. The Santa Clara is the official weekly newspaper of the University. The aim of The Santa Clara is: to publish the news of the University, to aid in constructive work, and to afford the students of Journalism an opportunity for actual practice in newspaper editing, managing and make-up.

The Redwood. The Redwood is the University annual published by the students to serve as a medium for literary work of more than passing merit, as a record of University activities, and as an expression of the student life of the University.

STUDENT CONGRESS OF THE UNIVERSITY

The Student Congress of the University is the student body organized for the encouragement of student activities, particularly Athletics, and such other work as may be recommended by the Faculty.

DEPARTMENTAL CLUBS

Each department of the University has its own organization for the study of technical problems and for the encouragement of social life among the students of the department.

The Engineering Society. This is an organization made up of students in the College of Engineering with the object of familiarizing them with the conduct of meetings of public bodies and the acquisition of ease in public speaking. Lectures to the engineering students are given before this body.

The Business Administration Association. This is an organization of students in the College of Business Administration for the study of business problems and for the encouragement of social activities among the students of the College. Frequent lectures are given before the Association by business men of prominence.

Mendel Club. This is an association of students in the Pre-Medical Department for the study of scientific subjects and the encouragement of such activities as are of particular interest to the students of this department.

Legal Fraternity. This is an organization of students in the College of Law for the discussion of legal subjects, for the encouragement of social activities among the students of Law, and for the upbuilding of the Law work of the University.

The Arts Society. This organization is made up of students of the College of Liberal Arts whose object is to create and foster literary talent among the students and to preserve the classical traditions for which the University has been noted for more than seventy-five years.

EXPENSES

Resident Students

Board, Lodging and Tuition, per semester	$350.00
Deposit for Laundry	20.00
Room Deposit	10.00

Non-Resident Students

Tuition, per semester	125.00
Tuition, for evening courses in Law, per semester	100.00

For All Students

Matriculation Fee, paid at entrance	$ 10.00
Student Body Fee, per semester	5.00
Gymnasium Fee, per semester	5.00
Library Fee, per semester	2.50
Deposit for Books:	
By Law Students, per semester	35.00
By Engineering Students, per semester	30.00
By other students	20.00

Special Charges

For registration on the first day after the opening of semester	2.50
For each day thereafter	1.00
For each examination taken out of time or to remove a condition	2.00
For course in Subject "A", each time	5.00
For each syllabus (synopsis of semester's work in any subject furnished by professor)	2.00
For each copy of student's record other than the first	2.00
Laboratories:	
Physics, Inorganic Chemistry, Biology 1, 2, 11, 12, each course, per semester	12.50
Premedical Chemistry, Biology 3, 4, each course, per semester	15.00
Engineering Geology, lecture and laboratory fees, per semester	15.00
Geology, lecture course only, per semester	2.50
Engineering, Freshman and Sophomore, shop or field, per semester	10.00
Engineering, Junior and Senior, per semester	25.00
Additional fee in all laboratories to cover breakage etc., per semester	5.00
Diplomas and Certificates:	
Junior Certificate	5.00
Degrees and other Certificates	10.00

Pocket Money and Incidentals

The amount of pocket money and money for incidentals is left entirely to parents and guardians. The University prefers that parents deal directly with the students. Should, however, parents or guardians wish the Treasurer of the University to look after these matters, they must deposit a sufficient amount with him and instruct him how the money is to be used. The University does not advance money for these purposes.

Infirmary Charges

No charges are made for the ordinary attendance of the University Physician. Medicines are charged at cost prices. For a room in the Infirmary, a dollar a day is charged.

Payments

All Charges Must be Paid Half-Yearly in Advance. Remittances should be made in the name of the University of Santa Clara. If payment is deferred without a satisfactory understanding with the President, the latter is directed by the Trustees to remove the student in question from the institution. Semester bills and unpaid balances are subject to sight draft ten days after the bill is rendered.

It is distinctly understood that no student is entitled to take any semester examination or receive any diploma or degree or be furnished with a record of his credits while any bills due the University remain unpaid.

When a student is withdrawn temporarily or permanently from the University the President must be directly informed, and money supplied for traveling expenses.

Articles to be Brought

The articles which every student coming to reside at the University should bring with him are, more or dess: blankets, bed-covers, sufficient wearing appared and toilet articles. Clothing to be sent to the laundry should be marked distinctly with the student's name before registration.

Opportunities for Self Help

Owing to the scholastic requirements of the University and the limited opportunities for profitable employment, students entering the University should be provided with sufficient funds to meet the major portion of their expenses. For worthy students of high scholastic standing there are available, to those who have been in residence one year or more, a limited number of University positions whereby they can earn a part of their expenses. All students, whether employed or not, must meet the same standard.

SCHOLARSHIPS

The Alice Phelan Sullivan Memorial Scholarship

This perpetual scholarship for a resident student was founded in 1912 by the gift of $12,500 from "A Friend" in memory of Mrs. Alice Phelan Sullivan of San Francisco.

The Jesse W. Bryan Memorial Scholarship

This perpetual scholarship for a resident student was founded in 1913 by the gift of $12,500 by Mrs. Sarah A. Bryan, in memory of her son Mr. Jesse W. Bryan, a former student of Santa Clara.

LOAN FUNDS

The following loan funds are open to students of the University under such conditions as may be provided by the President:

Filipello-de Saisset Loan Fund. A loan fund of $1,500.00, established in 1925 by Mrs. E. A. Filipello and Miss Isabel de Saisset.

Alumni Loan Fund. A loan fund of $500.00, established in 1925 by the Alumni of the University.

Knights of Columbus Loan Fund. A loan fund of $300.00 annually, established in 1925 by the State Education Committee of the Knights of Columbus of California.

PRIZES

Ordinary honors are awarded in all classes and in all subjects, to the students who are first and second in merit. Students whose yearly average is 85 per cent or over are given distinction. No student is eligible for a prize who has not been present for the whole year.

The following extraordinary prizes are open to competition on the dates announced in the University Calendar. The Faculty Committee of Scholarship and Standing reserves the right not to award any of these prizes in the absence of sufficient competition or a meritorious grade of scholarship. No one is eligible to compete a second time for a prize which he has already won, except after an interval of one year. Students who have not been in attendance for both semesters may not compete.

Nobili Medal. An annual prize of $60 founded by Joseph A. Donohoe, Esq., in honor of the First President of Santa Clara, Fr. John Nobili, S. J., to be given to the student in University Courses who shall be deemed first in morals, obedience and in application to study.

The Archbishop's Medal. An annual prize of $50.00, the gift of His Grace, Most Reverend Edward J. Hanna, D. D., Archbishop of San Francisco, in memory of his illustrious predecessor, Most Rev. Patrick William Riordan, D. D., for the student who shall have competed most successfully in an examination in Christian Doctrine.

The Ryland Prizes. The Hon. Caius T. Ryland founded in 1897 an annual purse of $45.00, leaving its matter to the discretion of the Faculty. This the Faculty, after due consideration, assigned to the University Literary Congress, organized February 22, 1857, establishing the Ryland Debate to be held yearly between the two branches, the Senate and the House, and divided the purse into three prizes of $20.00, $15.00 and $10.00, respectively. By an agreement between these societies, each in turn selects the question to be debated, and to the other is granted the choice of the side it will defend.

The McCann Prize. Annual prize of $15.00 founded in honor of Daniel B. McCann, B. S. '84, to be given for the best short story.

The Redwood Prize. Annual prize of $25.00 founded in 1908 by the executive committee of "The Redwood," and given for the best essay on an historical subject.

The Owl Prize. An annual prize of $25.00 founded by the directors of the former College Magazine, "The Owl," to be given to the winner of the oratorical contest in the University.

The William H. Leahy Prizes. Annual prizes of $25.00, $15.00 and $10.00, the gift of Mr. William H. Leahy, to be given for the best dramatic compositions.

The Orella Medal. An annual prize of $25.00, the gift of Dr. Firmin R. Orella, B. S. '89, to be given to the writer of the best paper on a scientific subject.

The Barchi Prizes. Annual purses of $15.00 and $10.00 given by Joseph M. Durney, Esq., for the best paper in such scientific subject as shall be determined by the faculty.

The Dramatic Art Prize. An annual prize, to be given to the winner of the Dramatic Art Contest.

The Donovan Prizes. The gift of Col. Joseph L. Donovan, U. S. A. (retired), Dean Emeritus of the College of Engineering, to be given as follows:

A cash prize of $25.00 for the best Senior Civil Engineering Thesis.

A cash prize of $15.00 for the best Junior Civil Engineering Design.

A cash prize of $20.00 for the best examination in Mathematics amongst the Sophomores of the Engineering Department.

Herman Budde Prize. A prize of $25.00 for the best essay on a selected subject.

The American Law Book Company Prize. A set of law books awarded to the student in the course of Legal Research having the highest average.

The Bancroft-Whitney Company Prize. A set of law books awarded to the member of the Senior year having the highest average.

The Catholic Italian Federation Prize of $25.00, awarded to the honor student in the classes of Italian.

Two Silver Medals to be given to the following students who become most distinguished for good conduct and application to study.

1. The most distinguished **Resident University** student.
2. The most distinguished **Non-Resident University** student.

ADMISSION

General Statement

Application for admission, accompanied by scholastic credentials and testimonials of character, should be filed with the Registrar on or before August 1st. It is obligatory to submit on entrance official records from the school last previously attended, together with a transcript of record of all previous High School and College credentials. These credentials are to be forwarded directly by the proper officer of the school last attended and not through the student.

Testimonials

All applicants for admission must present satisfactory evidence of good moral character and a certificate of honorable dismissal from the school last attended. In case of an intermission of study immediately preceding registration the testimonial of good character should come from some responsible person who has been in a position to know the habits of the applicant during that time. Moreover, all applicants must at the time of registration submit the names of three persons to whom the Faculty may refer for further information regarding their character. The certificate of honorable dismissal from the school last attended should be accompanied by a letter from the principal certifying to the fitness of the candidate for successful college work.

No application for admission will be given consideration until the testimonials herein provided for have been offered.

Scholarship Credentials

Candidates for admission to any of the undergraduate courses of the University must qualify:

(a) For admission to Freshman standing:

1. By evidence of the completion of the regular four-year high school course of the Preparatory Department of this University or of a similar course in an approved high school or,
2. By passing an examination in subjects equivalent to fifteen standard high school units. The subjects to be presented must be arranged in advance with the University.

(b) For admission to the undergraduate course of his choice. The following are the prescribed entrance units for the respective degrees offered by the University in its various courses:

	A.B.	Ph.B.	B.C.S.	B.S.*	LL.B.	Pre-Med.
English	3	3	3	3	3	3
Latin**	4					
Foreign Language**		2	2	2	2	2
Algebra	1	1	1	1½	1	1
Geometry	1	1	1	1½	1	1
History	2	2	2	1	2	2
Laboratory Science	1	1	1	1	1	1

* Also for B. S. in Ch. E., C. E., M. E., or E. E.

**Students entering with only two units of Latin for the A. B. course or without two units of foreign language for the other courses, will be given an opportunity to make up these deficient units during the first two years of college. Both units must be in the same language.

It is strongly recommended that the unprescribed units for the A. B., Ph. B. or LL. B. degrees be in Mathematics or Languages, preferably Latin; for the B. S. degrees in Sciences.

No credit is ordinarily allowed for physical education or music. One unit each may be accepted for commercial subjects, vocational subjects, and mechanical drawing.

Half units will be accepted only when presented in addition to integral units in the same subject or in half-year subjects which constitute a complete course in themselves, e. g., Solid Geometry. Any two of the biological sciences (Physiology, Botany, Zoology) may be combined into a continuous year's course equal to one unit.

The University reserves the right to require entrance examinations in the case of applicants whose certificates show grades below 80% in the prescribed units. Admission on school certificates is in all cases provisional and if, after admission, a student fails in any subject for which a school certificate was accepted, credit for that entrance subject may be cancelled.

A matriculation deficiency in a subject continued in the University in which the deficient student attains a grade of C (77-84), may be removed by the proper faculty, on the recommendation of the professor, with the approval of the Dean of the Faculties. Students, however, are cautioned not to assume in advance that this will be done.

Examination in Subject A

All lower division entrants in the colleges at Santa Clara must at

the time of their first registration in the University, take an examination, known as the Examination in Subject A, designed to test their ability to write English without gross errors in spelling, grammar, diction, sentence-structure and punctuation.

The examination in Subject A will be given within two weeks after the opening of each semester. The papers submitted in the examination will be rated as either "passed" or "not passed." Any student who is not present at the examination in Subject A which he is required to take will be rated the same as those who have not passed the examination.

All students who do not pass in the examination in Subject A will be required to take immediately after their failure, a course of instruction known as the Course in Subject A, without unit credit toward graduation. This course will be given each half year two hours a week for the semester, beginning one week after the examination. Every student who is required to take the course in Subject A will be charged a fee of $5 and the charge will be repeated each time he takes the course.

Admission to Advanced Standing

Admission to advanced standing is by specific action of the Committee on Credentials and Registration, which will evaluate all credits presented and determine the rating of the candidate.

Students from other institutions of recognized collegiate rank, including Junior Colleges with well-established courses, may be admitted to such standing and upon such terms as the Committee shall deem equitable. Every such candidate is required besides the prescribed testimonials of character and scholarship, to present a catalogue of the institution in which he has studied, and a full statement, duly certified, of the subjects he has therein completed and of the subjects there presented for entrance. The University reserves the right to determine after a test of at least one semester, the amount of credit that the applicant may receive and meanwhile he shall have the status of an unclassified student.

Admission of Special Students

Candidates for admission as special students must be persons of mature age who desire to take up special work in one department or in one subject with its related branches. Such special students are not candidates for a degree, but they may become candidates by satisfying the requirements for a regular course. No one will be admitted directly from a secondary school to the status of a special student. Entrance examinations in the subjects of fundamental importance for the work proposed will be assigned in practically all cases. Registra-

tion as a special student is for one semester only and no one may register for less than ten hours. Re-registration will be refused if the student has not shown earnestness and definiteness of purpose or if his work has been unsatisfactory in whole or in part.

Admission of Foreign Students

Candidates for admission who come from foreign countries must present original and complete educational credentials, together with a catalogue giving full description of the courses. Provisional registration may be then given pending verification of the record and until the student concerned has successfully completed one semester's work of not less than twelve hours, when permanent matriculation may be given. Students from other than English-speaking countries must, in addition, possess sufficient knowledge of English to carry satisfactorily their class work.

RELIGIOUS TRAINING

To cultivate the heart, no less than to develop the intellectual and physical faculties of the student, is a duty kept constantly and sacredly in view.

As the Faculty of the University profess the Catholic religion, the exercises of religious worship are Catholic; but members of any religious denomination are received, provided they be willing, for the sake of order and uniformity, to conform respectfully to the religious observances of the University.

The University authorities are convinced that without religion there can be no education in the truest sense of the word, that is to say, no complete and harmonious development of the intellect and heart of man. They hold furthermore, that religious truth, being definite and certain, may be taught with as much exactness as language or any other branch. Accordingly the study of Christian Doctrine is required of every Catholic student, and two periods weekly are devoted to it in every class of every course. One unit per semester is allowed for this work.

STUDENTS' HEALTH SERVICE

The University exercises supervision over the health of students. Though a certain degree of sickness is inevitable among so many, its percentage is very slight. A physician is in daily attendance at the University without extra charge for minor cases. A certificate of health, either from the home or from the resident physician, is required of each student. Wholesome food, regular hours for rising and retiring, excellent climate and ample opportunity for outdoor recreation, all combine to improve the general health of the students who are registered at Santa Clara.

DISCIPLINE

Students, whose homes are not in the neighborhood, must reside within the University unless they are accompanied by their parents.

All students are subject to examination by the University physician.

Students are not permitted to have books or other publications that have not been approved by the Vice-President.

The students' correspondence is subject to the inspection and control of the President.

To hold meetings or to form clubs or societies of any kind without the consent of the President, to enter pool rooms, the habitual use of profane language, unbecoming conduct either within or without the precincts of the institution, the possession or distribution of indecent publications or pictures, intoxication, procuring or introducing intoxicating liquors, directly or indirectly, into the University, habitual idleness and violation of the rules of the University, obstinate refusal to submit to a punishment inflicted, absence from the University at night without leave from the President, avowed principles of infidelity, express contempt or ridicule of religion, are offenses which expose the offenders to dismissal or suspension, as in the judgment of the Faculty shall be deemed necessary.

It is strictly forbidden for any student or group of students to haze any other student or subject him to any personal or physical indignity or treat him in such wise as may reasonably give offense.

No student will be permitted to leave the University on visits of any length, except during Christmas and Easter vacations, if such be the wish of his parents or guardian. Parents are requested not to call their sons home at other times, except in cases of urgent necessity, as such interruptions, besides tending to prevent the acquisition of habits of concentration and persevering work are apt to result in poor scholarship and interfere seriously with the student's entire scholastic training.

Students who, having left the University for the summer vacation, Christmas holidays, or other recesses allowed by the President, fail to be present on the day for the re-opening of class, may, by the fact of absence, be excluded from the University, or at the discretion of the Faculty from privileges until the following semester, unless parents or guardians show cause of absence which the Faculty shall consider wholly sufficient.

Promptness in reaching the University on the day fixed for the opening of classes is necessary. It is essential that parents and students understand this clearly from the beginning of their connection

with the University, as promptness in returning from vacation and recesses, which is requisite in order to prevent the loss of valuable time and the forming of habits of procrastination and negligence of duty, is strictly insisted on. Anyone returning after the date set down for the opening of the fall or spring semester will be required to pay a late registration fee of $2.50 for the first day and $1.00 for each day thereafter.

The University reserves the right to dismiss at any time a student who fails to give satisfactory evidence of earnestness of purpose and of interest, primarily in the serious work of college life. Dismissal may be made without specific charges and, in rare cases, perhaps on grounds that seem insufficient to students or parents. The University in these cases holds itself to be the more capable judge of what affects the interests of the institution and the student body.

Eligibility Rules

Except where otherwise specifically provided for by the Faculty, students taking part in public debates, oratorical or elocution contests or representing any department of the University in intercollegiate athletic events, as well as all those who are appointed on the staff of the University publications or as officers of student organizations, or are elected as captains or officers of any society, are subject, at the time of their selection or appointment, to the following eligibility rules: (1) They must have no conditions or failures; (2) They must have attained a satisfactory grade in conduct and application during the preceding month and a weighted average of C (77-84) in the last monthly or semester examinations; (3) They must not be under censure.

Any student admitted to the University on a scholarship or as a student-worker, who fails to obtain a semester average of C (77-84) in any of his subjects forfeits his right to his position or scholarship.

The registration of a student is deemed a recognition on his part and on the part of his parents or guardians of compliance with all the rules and regulations of the University, and acceptance of all conditions laid down in the catalogue.

Registration Card

Before registering for instruction in any department, the student must obtain a card signed by the Treasurer of the University, showing that a satisfactory settlement of his account has been made. This card is handed to the Director of Studies from whom the student must obtain another blank, write thereon the subjects elected and approved, and present it to his professors for their signature. This registration card is then returned to the Director of Studies, to be filed in his office.

SCHOLARSHIP

No student is eligible to enter any examination, written or oral, nor is he entitled to credit, unless he has been in attendance at 80 per cent of his classes, but students in the Institute of Law must have been present at 90 per cent of the classes. Absence caused by sickness will not excuse a student from the operation of this rule.

Written Work

The following written work is required of the students, in all the classes indicated:

In the course of Philosophy and Political Economy all upper division students must write and deliver to their professor every month an essay of not less than 1500 words, on a subject selected by him from the matter lately studied.

In all classes of Mathematics, three groups of problems are to be set weekly.

In all classes of English, a composition, essay, or poem, and two written exercises in addition, are to be given in weekly by the students.

In all classes of Modern Languages, there shall be as many written exercises as there are classes.

In classes of Latin and Greek three themes are to be handed in each week.

All of these out-of-class exercises will be corrected by the teacher, either in class or out of it, and returned to the students.

Written Examinations

Written examinations are held monthly in all subjects and in all departments. They are also held twice a year upon the work done during the preceding semester.

Oral Examinations

At the end of the scholastic year:

1. All candidates for the Junior Certificate in any department will be examined in such subjects as shall be prescribed by the Dean of the Faculties and which are requirements for their Junior Certificate.

2. Students who have followed the course in Elementary Law for one semester or more will be examined therein.

3. All students, regular or special, who have followed the courses in Philosophy, or any part thereof, in the upper division of any college will be examined therein.

No student will be orally examined unless he has passed satisfactorily all the written examinations given at the end of each semester on the matter therein, or having been conditioned in the first semester

examination, has removed the condition. The examination must extend to all work done during both semesters in the subjects indicated. The examination is to be conducted privately before a board of the Faculty who may increase the time allotted to any examination if they see fit. It does not determine the grade of a student's standing, but neither promotion nor credit is given without a successful examination.

General Requirements

In order to be accepted in fulfillment of any requirement for a degree, all work must be completed with grade D (70-76) or over, and the general average of the work must be of grade C ((77-84) or above.

The grade for work completed during the semester is computed as follows (all work being marked on the basis of 100% for perfect work):

For each mid-term grade, class-work counts two-thirds and the mid-term examination one-third;

For each semester grade, the average of the three mid-term grades counts two-thirds and the semester examination one-third.

Where an oral examination is required, the student is not promoted or graduated unless he attains therein a passing grade of D (70-76).

Special regulations as to the grades to be maintained by law students and candidates for degrees and certificates will be found under "College of Law, Graduation".

Amount of Work

In order to receive a degree, a student is required to complete the requisite number of semester hours and secure an equal number of credit points, i. e., an average rating of C grade or better in all subjects.

A semester hour is the standard for computing the amount of a student's work. A semester hour is defined as one lecture or recitation one hour in length per week for one semester. Two hours of laboratory work are equivalent to one recitation hour. Two hours of preparation on the part of the student are required for each hour of lecture or recitation.

Regular work for Freshmen is **sixteen hours** per week. For all others it may be from **fifteeen** to **eighteen** hours. Candidates for a degree will not be allowed to register for fewer than twelve hours of work.

No Freshman may register for more than **sixteen** credit hours (except in the College of Engineering) without special permission from the Dean of the Faculties, and such registration is not allowed to any student in his first semester of residence.

In the case of students of longer attendance, the Dean may grant permission to take studies up to eighteen credit hours a week, after the standing of the student in each study of the previous semester is examined and found to be B (85) or over. On the other hand, students carrying more than the normal amount of work who fail to maintain a standard of C (77-84) in all of their courses, may be restrictd by the Dean to the normal number of units. Even if, because of the difficulty of making the desirable courses total the exact limit, a student is permitted to carry a study-list slightly greater than the limits here set, or if a student transfers from another college where a greater study-list is permitted or required, the credit towards the degree will be limited strictly according to this rule.

Quality of Work

A student's grade of scholarship is given according to the following schedule:

Above passing:	Below passing:
A (93-100), Excellent	E (60-69), Conditioned
B (85-92), Good	F (0-59), Failed
C (77-84), Fair	I, Incomplete
D (70-76), Passed	W, Withdrawn

Conditions

A grade of E (60-69) at the end of a semester indicates a condition. A student who is conditioned in two subjects may be excluded from the University, but without prejudice to his continuing his studies at another University.

Where a student is conditioned at the end of the semester, he will be permitted to remove the condition at the time set for the examinations for the removal of cnditions.

Where a student is conditioned in a written or oral examination, given at the end of the school year, he will not be re-examined until the beginning of the next school year; provided however, that where a student is conditioned in a written or oral examination given as one of the final tests before graduation, he will not be re-examined until six months after receiving the conditions.

Where a student has been re-examined in any subject to remove a condition or reach a certain average, another examination may be permitted in the discretion of the Faculty; but in no case may it be taken until two months have elapsed since the former examination. If the student fails to reach the required average no further examination will be allowed.

Any student who enters his Senior year with a condition, will have the status of a special student unless this condition is removed within one month after the opening of the first semester.

Failures

A grade of F (0-59) at the close of a semester indicates a failure. A failure in a subject means that the student must repeat the work in class the next time it is given. A student who fails in two subjects may be excluded from the University.

A conditioned student who fails to pass a satisfactory examination at the time set for condition examinations, receives a failure in the subject, unless, on recommendation of his professor, the faculty shall permit him to review a subject in which he is thus deficient with the assistance of an acceptable private tutor; in which case he will be excused from attending the recitations, but will be required to take the regular examination at the end of the year or half-year.

If the condition is received in a Laboratory course, the student must make up the work in which he is deficient before the time of the condition examinations or receive a failure.

Credit Points

A candidate for a degree must gain not only the number of credit hours required, but his work must reach a certain standard of excellence. In addition to the required number of credit hours necessary for graduation, each student must earn an equal number of credit points, or an average mark in all subjects of C or better.

For a grade of A in a given course, a student will receive three times as many credit points as there are credit hours in that course; for a grade of B, twice as many credit points; for a grade of C, as many credit points as credit hours; while D gives credit hours but no points. For every condition or failure at the end of the semester, one credit point per credit hour is to be deducted from the total number of credit points that could otherwise be gained. Such lost points cannot be made up either by passing the condition examination or by repeating the course, even though the credit hour in such cases will count towards the total number of credit hours required for graduation.

For example: A four-hour course in which the student receives the grade of A gives 12 credit points; if the grade is B, 8 credit points; if C, 4 credit points; if D, no credit points. If the grade is E or F, four credit points are deducted.

Thus, in a course where 128 credit hours are required for graduation, the maximum number of credit points that can be secured by a student is 384; the minimum, 128.

Candidates for graduation must attend any course of lectures or any other exercises that have been or may be authorized and equipped by the Faculty, even though such courses receive no value in credits.

No student will be advanced to full junior standing who has less than 64 credit hours and 64 credit points by the end of his sophomore year.

Electing Studies

All students must inform the Director of Studies in writing as to their choice of subjects, and no one may enter upon a course or relinquish one already taken up without his advice and consent, upon penalty of receiving no credit in the first case, and a condition in the subject abandoned, in the second.

Candidacy for Degree or Certificate

Every person who wishes to become a candidate for a degree or certificate in any department of the University, must, not later than one month after his entrance, file with the Dean of the Faculties a written statement of the degree or certificate to which he aspires and the work which he proposes to do. He will then be informed whether he may be admitted as a candidate for such degree or certificate and whether the work proposed is satisfactory. Any change of purpose must be similarly announced and approved.

Thesis

Candidates for the junior certificate must submit an essay bearing on the matter studied in their course in English or some cognate subject. Candidates for a degree must submit a thesis on their major or some cognate subject. The thesis or essay shall consist of not fewer than 5000 words and shall be typewritten on National White unruled paper 8½x11 inches. The subject must be submitted to the Dean of the Faculties for approval not later than January 15 and the thesis itself handed in completed on the 15th of April of that same year. The presentation of an acceptable thesis is an absolute prerequisite for admission to final examination. The ultimate decision as to whether the effort merits the certificate or degree rests with the Committee on Theses.

COURSES, UNITS

Courses in the University are divided into three groups: The Lower Division, comprising the studies in the freshman and sophomore years, and leading to the junior certificate; the Upper Division, comprising the studies in the junior and senior years, and leading to the Bachelor's degree; and Graduate Courses, comprising graduate studies, and leading to advanced degrees.

Courses in the Lower Division are numbered from 1 to 100, and are marked COURSES FOR UNDERGRADUATES. Courses in the Upper Division are numbered from 101 to 200, and are marked COURSES FOR ADVANCED UNDERGRADUATES AND GRAD-

UATES. Courses for Graduate students are numbered from 201 up. Under certain conditions Lower Division courses may be taken for Upper Division credit, but in such cases it is expected that a higher standard of work shall be done and the instructor will assign additional work for such students. Upper Division subjects may be taken for Graduate credit under such conditions as may be prescribed by the Dean of the Faculties and the Professor in charge.

RECOMMENDATIONS TO OTHER SCHOOLS

No student will be recommended for entrance into any other University or College who has not maintained an average of B (85-92) in every subject throughout his course.

Students wishing Transcripts of Record in order to transfer to another school or for any other purpose should make early and seasonable application for the same. No such statements will be made out during the busy periods of examination and registration. Credentials which are accepted for admission become the property of the University and are kept permanently on file.

SESSIONS

The first semester begins about the middle of August and ends about December 20th.

The second semester begins about January 3rd and ends about May 15th.

As in most departments of the University new courses are not begun in January, students desiring to matriculate at the beginning of the second semester can only be received on condition that they are prepared up to the point then reached by the class which they desire to enter.

GRADUATE DEPARTMENT

The graduate department offers students who have attained academic degrees studies leading to the Master's or Doctor's degree. The determination of these courses rests with the Committee on Post-Graduate Studies. A sufficiently wide option is allowed, much of the instruction being in the form of direction along lines of original research. Courses may be had in the Classics, English and Public Speaking, History, Mathematics, Modern Language, Philosophy, Political and Social Sciences, Law and Engineering.

In the graduate division residence at any place or in any field which may be designated by the Dean of the Faculties as suitable for the work of a candidate for one of the advanced degrees is regarded as a residence at the University.

ADMISSION TO GRADUATE STANDING

The minimum requirements for graduate standing are fulfilled by graduates of colleges and universities of recognized grading, whose credentials evidence ability and promise, and who expect to become candidates for advanced degrees or who purpose to pursue regular advanced professional or research courses. In all cases evidence of the Bachelor's diploma must be presented along with a certified copy of the applicant's complete scholastic record. Admission to the graduate department does not of itself imply admission to candidacy for a higher degree. The grade of work which graduate students may elect and their standing will depend upon the extent and character of their undergraduate courses.

DEGREES

For the degree of Master of Arts (A. M.), the candidate must have an A. B. degree and must devote one year exclusively to resident graduate study, completing at least twenty-four semester hours. He must, moreover, pass a satisfactory examination, both written and oral, in all the subjects studied and he must present a typewritten or printed thesis in his major subject at least four weeks before the date fixed for the annual conferring of degrees. The ultimate decision as to whether the thesis merits the degree rests with the Committee on Theses.

For the degree of Master of Science (M. S.), the same conditions must be fulfilled as for the degree of Master of Arts, provided the

candidate has a B. S. degree and his major subject has been scientific.

For the degrees of Chemical Engineer (Ch. E.), Civil Engineer (C. E.), Electrical Engineer (E. E.), and Mechanical Engineer (M. E.), it is required that the candidate be a graduate in the College of Engineering of this University who has been engaged in acceptable professional work for a period of not less than three years after receiving the Bachelor's degree. Candidates for these degrees must declare their candidacy and file with the Dean of the College of Engineering a detailed statement covering their professional study and experience and an outline of their proposed thesis not later than December 31st preceding the commencement at which they wish to receive the degree, and they must submit the completed thesis not later than one month prior to the date fixed for the annual conferring of degrees.

For the degree of Doctor of Laws (J. D.), the candidate must in addition to completing all the work prescribed for the LL. B. degree complete, under conditions similar to those outlined for the A. M. degree, the courses set forth in the catalogue in Roman Law, International Law and the History of English Law.

For the degree of Doctor of Philosophy (Ph. D.), the candidate must complete not less than three years of graduate work in pursuance of an accepted course of study. The course in question must include one principal and one or two secondary subjects. A reading knowledge of French or German (and of Latin for those electing Scholastic Philosophy as their major course), is a perequisite. Moreover, the candidate must pass a satisfactory examination, both written and oral, on the work done and present a satisfactory thesis.

No degree in the graduate department will be conferred unless the candidate present himself in person at the commencement at which the degree is awarded.

COLLEGE OF LIBERAL ARTS

COLLEGE OF LIBERAL ARTS

Subject Requirements

(a) Prescribed subjects for the A. B. degree:

	Credit Hrs.		Credit Hrs.
English	16	History *	12
Latin	12	Metaphysics	12
Science	8	Ethics	6
Public Speaking †	4	Sociology	6
Mathematics	6	Political Economy	6
Logic	4	Evidences of Religion	8

(b) Prescribed subjects for the Ph. B. degree:

English	16	History *	12
Modern Language	12	Metaphysics	12
Science	8	Ethics	6
Public Speaking †	4	Sociology	6
Mathematics	6	Evidences of Religion	8
Logic	4	Political Economy	6

(c) Prescribed subjects for the B. S. degree:

English	12	History *	12
Modern Language	12	Metaphysics	12
Science	16	Ethics	6
Public Speaking	2	Mathematics	6
Logic	4	Evidences of Religion	8

* Students following the A. B. and Ph. B. courses may substitute six units of Elementary Law for six units of History. Students following the B. S. course may substitute six additional units of Mathematics for six units of History.

† Four units of Public Speaking are required for those students only who are following the Prelegal course; otherwise only two units are required.

Students who have received the Junior Certificate in other institutions must secure before graduation all the prescribed credits, except

those in Science, Mathematics and History. In place of these they may offer such electives as are approved by the Dean of the Faculties.

The prescribed courses in Evidences of Religion will be required only of Catholic students.

DEGREES

The College of Liberal Arts offers courses leading to the degrees of Bachelor of Arts (A. B.); Bachelor of Philosophy (Ph. B.); and Bachelor of Science (B. S.).

For students completing the prescribed work of the Freshman and Sophomore years there is conferred the Junior Certificate.

COURSES

Philosophy and Letters. The curriculum of Philosophy and Letters extends over four years and comprises courses of study selected with special regard to their cultural value, but which, far from being of merely cultural importance, afford the most solid foundation for the learned professions and for those larger commercial pursuits characteristic of the present age, which demand intellects carefully trained by the most efficient instruments available. To those students who, in addition to other prescribed studies, present a minimum of six years of Latin the degree of Bachelor of Arts is awarded. Students whose preparatory training in the classics was not sufficient to warrant their matriculation for the degree of Bachelor of Arts or who fail to offer the six years minimum requirement of Latin will be awarded the degree of Bachelor of Philosophy.

General Science. The curriculum of General Science likewise extends over four years and leads to the degree of Bachelor of Science. With the exception of the classical languages and literature for which modern languages and literature are substituted, this course contains all the strong studies of the curriculum of Philosophy and Letters and in addition offers supplementary courses in Biology, Chemistry, Mathematics, Physics and other scientific subjects.

Education. For students preparing to teach either in High School or College, courses are offered in the History and Theory of Education, which, with their prescribed and specialized courses in other departments, give the necessary technical preparation for such work.

Pre-Medical. This course, extending over three years, is designed to comply with the requirements of the best medical schools in the United States, and to give the student a preliminary laboratory training which will familiarize him with future work. Students so desiring may extend this course to cover the four years of General Science, leading to the degree of Bachelor of Science.

Pre-Dental. This course follows along the same general lines as the Premedical Course, and aims to prepare students for advanced work in Dentistry.

DIVISIONS OF THE COLLEGE

The College recognizes a lower and upper division. The work of the lower division comprises the studies of the freshman and sophomore years and on its successful completion the junior certificate is awarded. Its attainment is a prerequisite for admission to the upper division. For any degree a minimum of 128 units is required, 64 of which the student will normally take in the lower division and 64 in the upper. Each unit represents one hour of the student's time at the University weekly, during one-half year, in lecture or recitation, together with the time necessary in preparation therefor, or a longer time in laboratory or other exercises not requiring preparation.

No student may register for more than sixteen hours (outside of Religion) without special permission of the Faculty, and such registration is not allowed to any student in his first semester of residence. After one semester of regular work, students beyond freshman may receive permission to take not more than eighteen units per semester, provided they have attained a weighted average of at least B (85-92) the preceding semester. On the other hand, students carrying more than the normal amount of work who fail to maintain a standard of C (77-84) in all their courses may be restricted by the Dean to the normal number of units. Even if, because of the difficulty of making the desirable courses total the exact limit, a student is permitted to carry a study-list slightly greater than the limits here set, or if a student transfers from another college where a greater study-list is permitted or required, the credit towards the degree will be limited according to this rule.

Honorable mention will be granted with the junior certificate to students who attain a B (85-92) grade in 45 units.

LOWER DIVISION

In the lower division it is expected that the student, in addition to fulfilling the prerequisites for the major work upon which he will concentrate in the upper division, will make an effort to establish a basis for that breadth of culture which will give him a realization of the methods and results of some of the more important types of intellectual endeavor, and a mental perspective that will aid him in reaching sound judgments. The junior certificate requirements were designed to provide in some measure for the accomplishment of this purpose, without unduly limiting the student's opportunity to satisfy his individual tastes and preferences.

Certain courses taken in the high school are accepted as fulfilling in part or in whole some of these junior certificate requirements. It is desirable that the student should so arrange his high school programme as to reduce the required work in the fields of foreign languages, mathematics and the natural sciences. This makes his programme more flexible, gives him greater freedom of choice, and prepares him to pass more quickly into advanced work or into new fields of study. In no case, however, does the satisfaction of junior certificate requirements in the high school reduce the amount of work required in the university for the junior certificate or for the degree. The junior certificate will be granted on the completion of not less than 64 units of college work and the fulfillment, presupposing the prescribed entrance requirements and the successful completion of Subject "A", of the requirements specified in the respective courses.

Pre-legal Requirements are met by students following A. B. or Ph. B. courses and substituting Elementary Law for History.

Moreover, all candidates for the junior certificate must submit an essay bearing on the matter studied in their course in English or some cognate subject and consisting of not fewer than 5000 words, as provided in the general regulations. The presentation of an acceptable essay is an absolute prerequisite for admission to final examinations. The ultimate decision as to whether the effort merits the certificate rests with the Committee on Theses.

Candidates for the junior certificate must moreover pass all prescribed oral examinations provided for in the General Regulations contained in this catalogue.

UPPER DIVISION

Only those students who have been granted the junior certificate, signifying their completion of lower division requirements, will be registered as regular students in the upper division.

Degree in the College of Liberal Arts will be granted upon the following conditions:

1. The total number of units in college courses in the lower and upper divisions offered for the degree must be at least 128.

2. At least 60 units of upper division subjects must be completed after the receipt of the junior certificate. Where lower division units are taken for upper division credit both the quantity and quality of such work must conform to upper division standards.

3. Candidates for graduation must complete a major of 24 upper division units, representing the required work in Philosophy, Political Economy and Sociology.

4. In addition to the prescribed major, a minor of 12 upper division units must be completed in each of two other departments, one of which may represent professional courses in an approved combined course. Not more than 24 units of upper division courses in one department will be counted towards the degree.

5. Candidates for a degree must submit a thesis on their major or some cognate subject consisting of no fewer than 5000 words, as prescribed in the General Regulations. The presentation of an acceptable thesis is an absolute prerequisite for admission to final examination. The ultimate decision as to whether the effort merits the degree rests with the Committee on Theses.

6. Candidates for graduation must moreover pass all prescribed oral examinations provided for in the General Regulations.

7. Residence of at least one year immediately preceding graduation is required for the granting of any degree.

MAJORS AND MINORS

Major. A major of 24 units in Philosophy is required of all candidates for a degree, covering the following courses:

Philosophy 101, 102, 103, 104, 107.
Political Economy 101, 102.
Sociology 101.

Minor. A minor in each of two of the following departments, consisting of not less than 12 nor more than 24 units, shall be presented in addition to the major:

Classics.
Education.
English and Public Speaking.
History
Mathematics and Science
Modern Language.
Law
Political Economy.

Electives. Courses not taken as prescribed courses and not included in the student's Major and Minor sequences may be chosen as free electives to complete the 128 units required for graduation.

Additional Units. When the nature of the course permits, students taking a course as a Major or Minor, with the approval of the Dean of Faculties, may arrange to present work for additional credit in such course. Such work shall be done under the direction of the Professor in charge and in both quantity and quality shall conform to the required standard of the course.

DESCRIPTION OF COURSES

THE CLASSICS

LATIN

Courses for Undergraduates

1. Cicero. The orations studied as models of oratorical art; rapid reading, analysis, discussion, criticism. Latin composition based on special text and matter read in class. Three hours. One semester. Three units.

Prerequisite: High School Latin: 4 years.

2. The Epic—The Aeneid. After reading books VII-XII, the poem will be studied as a whole, special attention being given to the sources, to the epic technique and literary art of Virgil and to the tracing of his influence in the literature of the world. Narration and descriptive composition based chiefly on the text of the Aeneid and implying a discrimination of the vocabulary and syntax of prose and verse. Students will write three compositions weekly. Three hours. One semester. Three units.

Prerequisite: Latin 1.

3. The Latin Historians. Copious reading in Sallust, Curtius, Pliny and Livy, with critical consideration of the historical works of these writers and collateral reading directed to reach an appreciation of their place in Latin literature. Latin composition based on the Latin historians. Three hours. One semester. Three units.

Prerequisite: Latin 2.

4. The Lyric and Elegiac Poets. The Odes of Horace, books I-IV, with selections from the "Ars Poetica," and the elegies of Ovid and Propertius, will be read and carefully studied. Such phases of Roman life as are suggested will be the subject of collateral reading under the direction of the professor. Latin composition. Students will be expected to show facility and elegance of diction in their written work. Three hours. One semester. Three units.

Prerequisite: Latin 3.

7. Special Latin. A rapid review of elementary Latin, including grammar, composition and rapid reading of easy passages. Intended for students with an amount of High School Latin insufficient to enter Latin 1. Hours and credits to be arranged.

Courses for Advanced Undergraduates and Graduates

101. The Drama. A critical study of the Latin dramatists: Seneca, Plautus, Terence. Three hours. One semester. Three units.

102. Historical Survey of Latin Literature. Three hours. One semester. Three units.

107. Latin Seminar. Hours and credits to be arranged.

GREEK

Courses for Undergraduates

1. Elementary Greek. The course is intended for those who enter without Greek. Grammar; simple Prose selections; composition. Three hours. First semester. Three units.

2. Elementary Greek. A continuation of Greek 1. Readings from Xenophon, Anabasis, with prose composition based on Xenophon. Three hours. Second semester.
Prerequisite: Greek 1. Three units.

3. Intermediate Greek. A continuation of the grammar, with readings and prose composition. Selected portions of the Iliad or Odyssey of Homer; Homeric Dialect; outline of Greek epic poetry. Three hours. First semester. Three units.

4. Intermediate Greek. A continuation of Greek 3, with special emphasis on sight reading and advanced prose composition. Three hours. Second semester.
Prerequisite: Greek 3. Three units.

Courses for Advanced Undergraduates and Graduates

170. Seminar. Advanced study of particular problems of Greek life. history and literature.

EDUCATION

Courses for Advanced Undergraduates

101-102. History of Education. A general history of Education from the earliest times to the present day. Embraces in particular dominant phases of modern education; influence of Greek and Medieval Education on the systems prevalent today. Three hours, both semesters. Six units.

103-104. History of Secondary Education. A more detailed study. Catholic influences. The present status of the Catholic school and current problems of administration. Three hours, both semesters.
Six units.

105-106. Educational Psychology. A study of the mental development of the adolescent; mental testing; moral and religious development; general laws of learning; mental hygiene; the value of tendencies. Three hours. Both semesters. Six units.

107. Education for Citizenship. Explanation of the opportunities in the modern school for civic training and experience. Clarification by examples of the modern social existence; guide of procedure established. Three hours. One semester. Three units.

108. Secondary Education. A complete survey of the field of secondary education; a detailed study of the secondary studies; the school's extra-curricular activities; guidance functions of the secondary school. This includes an introductory course and an advanced course. Three hours. One semester. Three units.

PHYSICAL EDUCATION

Courses for Undergraduates

A, B. Prescribed Physical Training for Freshmen. Two hours weekly throughout the year. One unit.

P. E. 1. Hygiene and First Aid. A course covering the Problems of personal hygiene and general health. First aid to the injured. Includes a short course in the treatment and care of minor injuries that occur frequently in the gymnasium or on the athletic field. Two hours. First semester. Two units.

P. E. 2. Methods in Play Activities. Methods in football. Methods in track and field. Methods in basketball. Methods in baseball. Methods in routine athletics. Methods in minor sports. Two hours, both semesters. Four units.

P. E. 3. Methods in Formal Activities. Development drills. Postural instruction. Marching. Aims and values of gymnastics. Two class hours gymnasium. Second semeter. One unit.

Courses for Advanced Undergraduates

P. E. 104. Practice Teaching. Students are given charge of classlems. Present Movement in physical education. Objectives in naturalized physical education. Education through play. Health education. Two hours. First semester. Two units.

P. E. 102. Theory of Teaching and Leadership in Physical Education in the Secondary Schools. What leadership or teaching requires of the teacher. Definitions and aims of Physical Education. Essentials for successful teaching. Control and class management. Discipline and attention. Leadership and friendly relations. Includes instruction in methods of leadership of value to the teacher in the discipline and control of school teams. One class hour. First semester. One unit.

P. E. 103. Administration of Physical Education in Secondary Schools. Methods of developing good relationship with principal, students, physicians and community. Organization of new classes. Records. Organization of incentives. Public demonstration of work, and how organized. Discipline. Care of equipment. Proper grouping of boys for class work. Observation and functional tests. Four point system and its advantages. A program of competitive athletics for all and how developed. Organization of play at odd hours. Two class hours. Second semester. Two units.

P. E. 101. Practice Teaching. Students are given charge of classes in the city schools. Problems discussed in weekly group conferences. The teaching is supervised by members of the Department of Physical Education. Periods to be arranged. Four units.

ENGLISH

Courses for Undergraduates

1. Freshman Rhetoric. A study of the principles of literary art in all its forms, with special attention to the mechanics of writing. Practice writing based on assigned reading. Three hours. First semester. Three units.

2. Introduction of the Study of Poetry. Its nature and kinds. especially the epic, the lyric and the drama. Practice in verse composition in imitation of authors read. Three hours. Second semester. Three units.

3. Early English Literature. A study of the beginnings of English literature, including the Saxon, Norman and Early English periods. Lectures and recitations. Two hours. One semester. Two units.

4. Elizabethan Literature. A study of the more prominent writers during the Tudor and Stuart reigns, with special emphasis on the Elizabethan period. Lectures and recitations. Two hours. One semester. Two units.

5. Argumentation and Oratory. Invention, arrangement and development of thought; a course presenting the principles of reasoning and persuasion. Critical analysis and discussion of classic specimens or oratorical composition, ancient and modern. Three hours. One semester. Three units.

6. **The Essay.** A study of the various forms of essay, based on and accompanied by extensive readings and discussions in the field of essay literature. Three hours. One Semester. Three units.

7. **The Novel. The Short Story.** A detailed study of technique of modern prose illustrated by selections from classic authors. Lectures and discussions, with assigned readings. Three hours. One semester. Three units.

8. **Georgian Literature.** English Literature from the time of Queen Anne to that of Queen Victoria. Lectures and recitations. Two hours. One semester. Two Units.

9. **Victorian and Modern English Literature.** A study of the leading writers from the reign of Queen Victoria down to the present, including contemporary American writers. Lectures and recitations. Two hours. One semester. Two Units.

21. **Journalism.** News writing and reporting. A study of news values and sources of news; structure and style in news stories; feature writing. Lectures and discussions. Practice and laboratory work. Two hours. Two semesters. Four units.

Courses for Advanced Undergraduates and Graduates

101. **Representative English and American Essayists.** An advanced course in the study of the essay with directed reading to give a fuller appreciation of this form of literature. Two hours. One semester. Two units.

102. **Nineteenth Century Poets.** An advanced course based on the study and interpretation of English poetry of the Nineteenth Century. Two hours. One semester. Two units.

103. **Shakespeare.** An introduction to Shakespeare, with rapid reading of most of his plays in chronological sequence. Discussion of historical background and influence of Shakespeare in the development of dramatic literature. Two hours. One semester. Two units.

104. Shakespeare. A continuation of Course 103, stressing a more intensive study of a few plays. Two hours. One semester. Two units.

105. Advanced Oratorical Composition. Open to those who have taken English 4. An advanced course in the theory and practice of argumentation, together with critical analyses of oratorical masterpieces. Two hours. One semester. Two units.

170. Seminar in English Literature. A discussion of special writers or special periods in English Literature. Hours and credits to be arranged.

PUBLIC SPEAKING AND EXPRESSION

Courses for Undergraduates

1. Fundamentals of Expression. The fundamental principles of expression; the speaking voice; body and expressive movement. Training the voice and body to be the willing and obedient servant of the mind. Each student appears in memorized work in class. Two hours. First semester. One unit.

2. Fundamentals of Expression. A continuation of course 1, with development of impersonation and interpretation. Two hours. Second semester. One unit.

3. Philosophy of Expression. An advanced study of the principles of expression; advanced training of the voice; embodiment of principles in practice work. A short selected cutting of standard literature is presented by each student at each class. Special training in the interpretation of longer selections for public presentation. Two hours. First semester. One unit.

4. Philosophy of Expression. A continuation of course 3, with special emphasis upon impersonation, and standard speeches. Two hours. Second semester. One unit.

11. Fundamentals of Expression. A short course in expression intended primarily for students in the College of Engineering. Fundamentals of expression; the speaking voice; expressive movement; impersonation; interpretation. Each student must appear in memorized work at each class. One hour. First semester. One unit.

12. Fundamentals of Expression. A continuation of course 11. One hour. Second semester. One unit.

Courses for Advanced Undergraduates and Graduates

101 **Aesthetics.** An advanced course where every principle taught in previous courses is put to practical test. Each student is required to memorize and present during the course a short play, in which he impersonates all of the different characters and interprets both the particular parts and the play as a whole. One hour. First semester. One unit.

102. **Aesthetics.** A continuation of course 101. One hour. Second semester. One unit.

107. **Dramatic Seminar.** The mechanics of the theater and the staging of a play, both theory and practice. Lines: voice, body, impersonation. Business: pantomime and stage. Plots: ground, light, scenery, property. Mechanics: illusions and terminology. Criticism: Play-reviewing and dramatic criticism. Hours and credits to be arranged.

109. **Debating Seminar.** The application of the principles of expression to the Debate. A study of the particular form of debating. Presentation and arrangement of ideas. Practical application of methods in connection with a major collegiate debate. Hours and credits to be arranged.

HISTORY AND POLITICAL SCIENCE

Courses for Undergraduates

1. **European History: The Renaissance and the Protestant Revolution.** General character of the period. The Renaissance. The Age of Charles V. The Protestant Revolution and the Catholic revival. Three hours. First semester. Three units.

2. **European History: The Catholic Revival to the French Revolution.** Extent and influence of the Catholic Revival. The Wars of Religion. The Puritan Revolution. Age of Louis XIV. Wars between England and France. Rise of Prussia. Causes of the French Revolution. The French Revolution and Napoleonic era. Three hours. Second semester. Three units.

3. **European History: From the Restoration to the Franco-Prussian War.** Influence of the Napoleonic era. The period of reaction. The revolutionary movement in France and Germany. Growth of democracy in England. Establishment of the German Empire. Rise of Italy. European colonial policies. The Franco-Prussian war. Three hours. First semester. Three units.

4. European History: From the Franco-Prussian War to the World War. Rise of national states: Germany, Italy, etc. Colonial expansion. Industrial development. The Russo-Japanese war. The Entente and Triple Alliance. Causes of the World War. The World War. Effects of the World War. Three hours. Second semester. Three units.

15. Economic History of Europe. (This course is described in the College of Business Administration as B. A. 15.) A general survey of the economic development of Europe from the eleventh century to modern times, with special emphasis upon the growth and development of English industry and commerce. Three hours. First semester. Three units.

16. Economic History of the United States. (This course is described in the College of Business Administration as B. A. 16.) A study of the economic development of the United States with special reference to the labor problems arising from the rapid growth of the factory system in industry. Three hours. Second semester. Three units.

Courses for Advanced Undergraduates

101. History of American Diplomacy, 1778-1861. A Survey of the Foreign Relations of the United States from the French Alliance in 1778 to the Convention of London in 1861. Special study of the efforts of the New Republic to win the support of France, the struggle to merit the respect of the European Nations and the assertion of its position in the Americas by the Monroe Doctrine. Two hours. One semester. Two units.

102. History of American Diplomacy, 1861-1918. A Survey of the Foreign Relations of the United States from the Convention of London, 1861, to the conclusion of the World War. Special study of the problems arising from the maintenance of the Monroe Doctrine both in our diplomatic relations with the European Powers and the Republics in the Americas. Discussion of the problems of the Pacific. Two hours. One semester. Two units.

103. Political History of the United States, 1789-1861. A study of the problems confronting the newly formed government arising from the various interpretations of the Constitution by the different political parties. Special study of the assumption of power by the central government. Two hours. One semester. Two units.

104. History of the United States, 1898-1924. This course is arranged for Seniors in order to acquaint them with the history of those problems which still require solution. The Philippines. Intervention in South America by the United States. The Treaty of Versailles. President Wilson and the Fourteen Points. The Formation of the League of Nations. The World Court. Two hours. One semester. Two units.

All students in Courses 101, 102, 103, 104, must write one term paper each semester.

105. Constitutional History of the United States. A detailed study of the American Constitution. Three hours. One semester. Three units.

106. Constitutional Law (Law 204). A professional course covering the legal aspects of constitutional rights and duties; powers of government; political rights; interstate privileges and immunities, etc. Two hours.One Semester. Two units.

107. International Law (Law 203). A professional course dealing with international policies and conflict of laws. Two hours. One semester. Two units.

ELEMENTARY LAW

Courses for Undergraduates

1. Elementary Law. This is an elementary course intended primarily for undergraduates in the Pre-Legal course of the College of Liberal Arts, and is a prerequisite for all advanced courses in the Institute of Law. Robinson's Elementary Law. Three hours. First semester.

Prerequisite: Sophomore standing. Three units.

2. Elementary Law. A continuation of Law 1. Three hours. Second semester.

Prerequisite: Law 1. Three units.

For additional courses in Law see Courses in the Institute of Law, and in the College of Business Administration.

MATHEMATICS

Courses for Undergraduates

1. College Algebra. Complete Algebra to include quadratic equations; then more particularly; ratio and proportion, progressions, imaginary and complex numbers, indeterminate equations, binomial theorem, variables and limts, inequalities, interpretation of results, logarithms, permutations and combinations, undetermined coefficients, determinants and graphic algebra. Three hours. First semester. Three units.

2. Trigonometry. Development of general formulae. Functions and their relations. Logarithms and their uses. Properties of triangles. Application of principles to practical problems in right and oblique triangles. Navigation in plane trigonometrical problems. Spherical trigonometry. Application to problems in astronomy and spherical mensuration. Three hours. One semester. Three units.
Prerequisite: Mathematics 11. Three units.

13. Analytic Geometry. Loci. Lines. Circle. Different systems of co-ordinates. Conic sections. Supplementary proportions. Loci of second order. Plane curves of higher order. Solid analytical geometry, especially of revolution. General equations. Three hours. One semester.
Prerequisite: Mathematics 1, 2. Three units.

14. Calculus. Fundamental Formulae and principles for differential and integral Calculus. Maxima and minima. Curvature. Surfaces. Volumes. Intermediate forms. Envelopes. Series Expansion. Forms of integration. Practical application. Three hours. One semester.
Prerequisite: Mathematics 13. Three units.

15. Calculus. Continuation of Mathematics 14. Four hours. Second semester.
Prerequisite: Mathematics 14. Four units.

Courses for Advanced Undergraduates and Graduates

116. Differential Equations. Analysis and deduction of formulae and equations used in physics, mechanics and engineering problems. Applications of formulae and equations given in engineering handbooks to problems. Practical problems and lectures. Two hours. Second semester.
Prerequisite: Mathematics 15. Two units.

117. Methods of Least Squares. Study of the principles and methods. Applications to solution of physical, astronomical, engineering and other problems. The student will be made familiar with this higher and more accurate method of solution of problems in his profession, especially triangulations. Two hours. Second semester.
Prerequisite: Mathematics 15. Two units.

MODERN LANGUAGES

FRENCH

Courses for Undergraduates

1. Elementary French. In this course the student is carefully drilled in elementary grammar up to the irregular verbs, attention also being given to acquiring a vocabulary of the more common words. Three hours. One semester. Three units.

2. Elementary French. A continuation of French 1. Special attention is given to the more important irregular verbs, the memorizing of words, and translation of French into English and vice versa. Three hours. One semester.

Prerequisite: French 1. Three units.

3. Intermediate French. A thorough review of grammar and syntax. The object of this course is to acquaint the student with the general vocabulary and enable him to read the more simple French writers. Three hours. One semester.

Prerequisite: French 2. Three units.

4. Intermediate French. This course continues the work begun in French 3. Regular exercises are given in written work, and copious reading is made from the standard works in order to fit the student for professional reading. Three hours. One semester.

Prerequisite: French 3. Three units.

5, 6. Advanced Composition and Reading. Compositions and sight reading; oral and written reports in French; conversation; survey of French literature. This course is conducted almost entirely in French. Two hours. Both semesters. Four units.

GERMAN

Courses for Undergraduates

1. Elementary German. Elements of German Grammar. Drill in pronunciation. Vocabulary. Three hours. One semester. Three units.

2. Elementary German. A continuation of German 1. Syntax. Oral and written exercises. Reading from more simple German prose. Three hours. One semester.

Prerequisite: German 1. Three units.

3. Intermediate German. Review of syntax. Translation. Oral and written exercises. Reading from German scientific works to acquire a technical vocabulary. Three hours. One semester.
Prerequisite: German 2. Three units.

4. Intermediate German. Reading and written and oral exercises in technical German. This course aims at preparing the students to undertake the reading of the more difficult scientific works. Three hours. One semester.
Prerequisite: German 3. Three units.

5, 6. Advanced Composition and Reading. Composition; sight reading; oral and written reports in German; conversation; historical survey of German literature. This course is conducted almost entirely in German. Two hours. Both semesters. Four units.

ITALIAN

Courses for Undergraduates

1. Elementary Italian. Elements of Italian Grammar. Drill in Pronunciation. Vocabulary. Three hours. One semester.
Three units.

2. Elementary Italian. A continuation of Italian 1. Syntax; oral and written exercises. Reading from simpler Italian prose. Three hours. One semester.
Prerequisite: Italian 1. Three units.

3. Intermediate Italian. Review of Grammar and Syntax. Translation. Oral and written exercises. Reading of somewhat difficult Italian prose. Three hours. One semester.
Prerequisite: Italian 2. Three units.

4. Intermediate Italian. Reading, written and oral exercises. This course aims at preparing the student to read the more difficult Italian writers. Three hours. One semester.
Prerequisite: Italian 3. Three units.

5, 6. Italian Literature. A study of special periods and writers in Italian literature, with emphasis on their literary qualities. The development of fluency in Italian composition and pronunciation. An easy reading, writing and conversational knowledge of Italian is presumed. Hours and credits to be arranged.

SPANISH

Courses for Undergraduates

1. Elementary Spanish. Elements of Spanish grammar. Drill in pronunciation. Vocabulary. Three hours. One semester. Three units.

2. Elementary Spanish. A continuation of Spanish 1. Syntax, oral and written exercises. Reading from the simpler Spanish prose. Three hours. One semester.
Prerequisite: Spanish 1. Three units.

3. Intermediate Spanish. Review of grammar and syntax. Translation. Oral and written exercises. Reading of somewhat difficult Spanish prose. Three hours. One semester.
Prerequisite: Spanish 2. Three units.

4. Intermediate Spanish. Reading, written and oral exercises. This course aims at preparing the student to read the more difficult Spanish writers. Three hours. One semester.
Prerequisite: Spanish 3. Three units.

5, 6. Advanced Composition and Reading. Compositions; sight reading; oral and written reports in Spanish; historical survey of Spanish literature. This course is conducted almost entirely in Spanish. Two hours. Both semesters. Four units.

PHILOSOPHY

Courses for Undergraduates

1. Logic: Dialectics. This course is concerned mainly with the nature and acts of the mind, ideas, judgments, the syllogism, the laws of correct reasoning; induction and deduction, argumentation and proof. Two hours. One semester. Two units.

2. Logic: Critics. Truth and error, the nature, possibility, degrees, motives and criteria of certitude. Two hours. One semester.
Prerequisite: Philosophy 1. Two units.

3. General Metaphysics. Ontology. A methodical investigation of the fundamental aspects of Being, its primary divisions and transcendental attributes. Potency and Act. Substance and Accident. Three hours. One semester.
Prerequisite: Philosophy 2. Three units.

4. Metaphysics. (a) The Cause. The notion of Cause and its divisions. (b) The universe and matter. General properties of matter. The origin of the material universe; the constitution of inorganic bodies. Life. Spiritual and organic life. Mechanical theory of life. The evolutionist and matter. Three hours. Second semester. Three units.

Prerequisite: Philosophy 3.

11-14. The following courses are primarily for Junior-Senior Engineers and Premedical students:

11. Logic. The reasoning faculties and processes. Laws of thought. Truth. Certitude. Doubt. False systems. Three hours. First semester. Three units.

12. Ontology, Psychology. Being, its origin, development, explanation. Life, its origin and kinds. Origin and Species. Darwinism. Huxley. Haeckel. The Soul, its origin and spirituality. Three hours. Second semester. Three units.

Prerequisite: Philosophy 11.

13. Theodicy and General Ethics. (a) God, His existence, nature and attributes. Creation. Providence. Miracles.

(b) General Ethics. The nature of the moral act; right and wrong; natural and positive moral law; conscience, right and duties. Three hours. One semester. Three units.

14. Applied Ethics. Individual and Social; religious worship; domestic society: the family, marriage, divorce. Civil Society or the state, its nature, origin, purpose. Theories of government. Suffrage. Liberty of press. Professional ethics stressed. Three hours. One semester. Three units.

Prerequisite: Philosophy 13.

Courses for Advanced Undergraduates

101. Psychology. Beginning with an explanation of the cerebro-spinal nervous system, this course leads on to the study of the phenomena of sensuous life; sense perception, imagination and memory, sensuous appetite, movement and feeling. Rational life; the origin and development of rational concepts, rational appetency, free will and determinism. The origin, nature and destiny of the human soul, the union of the soul and body. The modern psychologists on the nature and existence of the human soul examined and refuted. Three hours. August to February. Three units.

Prerequisite: Junior standing.

102. Theodicy. Proofs of the existence of God; His essence; examination of pantheistic systems; the divine immutability, immensity, eternity; the divine intellect and will; moral attributes of God; His omnipotence; divine providence. Three hours. February to May.

Prerequisite: Philosophy 101. Three units.

103. Fundamental Ethics. Treats the subjects belonging to general theory; the nature of the moral act, the distinction between moral good and moral evil, moral habits, natural and positive moral law; conscience, rights and duties. Four hours. One semester.

Prerequisite: Senior standing. Four units.

104. Applied Ethics. The application of the general principles of ethics to particular and social rights and obligations; the rights to property, life, honor; the rights and obligations of domestic society, marriage and divorce. Civil society; its nature and forms; the rights of civil authority. Church and state; the ethics of international relations, peace and war. Four hours. Second semester.

Prerequisite: Philosophy 103. Four units.

107. History of Philosophy. Socrates. Plato. Aristotle. Stoicism. Epicureanism. Plotinus. Alexandrian Philosophy. St. Augustine. Early Christian Philosophy. Scholastic Philosophy. St. Thomas. Modern Philosophy. Descartes. Locke. Hume. Kant. Hegel. Spencer. Neo-Scholasticism. Turner's History of Philosophy. Three hours. One semester.

Prerequisite: At least two years of Philosophy. Three units.

170. Seminar. A study of particular periods and problems in Philosophy, with assigned readings, discussions and thesis. Hours and credits to be arranged.

POLITICAL ECONOMY

Courses for Undergraduates

1A. Principles of Economics. (This course is described in the College of Business Administration as B. A. 1A-1B.) The economic principles involved in the production, distribution and consumption of wealth. Study of textbook supplemented by lectures, discussions and assigned readings. Three hours. First semester.

Prerequisite: Sophomore standing. Three units.

1B. Principles of Economics. A continuation of Political Economy 1A. Three hours. Second semester

Prerequisite: Political Economy 1A. Three units.

15. Economic History of Europe. (Described in the College of Business Administration as B. A. 15.) Three hours. First semester. Three units.

16. Economic History of the United States. (Described in the College of Business Administration as B. A. 16.) Three hours. Second semester. Three units.

Courses for Advanced Undergraduates and Graduates

101. Principles of Political Economy. (This course is described in the College of Business Administration as B. A. 101.) An advanced course in the history, methods and principles of Political Economy, with special reference to wealth, value, price, production and the factors of exchange, money and credit. Three hours. First semester.
Prerequisite: Junior standing. Three units.

102. Principles of Political Economy. A continuation of course 101, with special reference to socialism, labor problems, the tariff and modern economic problems. Three hours. Second semester.
Prerequisite: Political Economy 101. Three units.

For additional courses see College of Business Administration.

POLITICAL AND SOCIAL SCIENCES

For courses in Political Science see Department of History and Political Science.

SOCIOLOGY

Courses for Advanced Undergraduates and Graduates

101-2. Principles of Sociology. An introduction to the scientific study of social problems and their relation to the family and the individual. A study of the natural resources, population, immigration, labor organization, woman and child labor, poverty, crime, housing, etc. Three hours. Both semesters.
Prerequisite: Junior standing. Six units.

RELIGION

Courses for Undergraduates

1. Essentials of Christian Doctrine. Various creeds. The Apostle's Creed. Each Article of the Creed is studied in particular, attention being given to any subject bearing directly on these articles, as Sin, The Powers of the Church, Infallibility, etc. Two hours. First semester. One unit.

2. Essentials of Christian Doctrine. The Law of God. What is commanded or forbidden by the Decalogue is studied in detail. The Precepts of the Church, Grace, Prayer, and each of the Seven Sacraments together with collateral subjects. Two hours. Second semester. One unit.

3. Christianity, A Revealed Religion. What Religion is. What Revelation is. Kinds of revelations. What revelation necessary to know truths above human knowledge. Man's attitude toward Revelation. Primitive, Patriarchal, Mosaic Revelation. The Divine origin of Pre-Christian Revelation. The Christian Revelation: it's origin, evidences of the divinity of its origin. Two hours. First semester. One unit.

4. The Church: The Dispenser of the Christian Religion. Institution of the Church. End of the Church. Constitution of the Church. Marks of the Church. The teaching office of the Church. Sources of the Church's teaching. The Rule of Faith. Two hours. Second semester. One unit.

Courses for Advanced Undergraduates and Graduates

101. Christian Dogma. God, the Author and Restorer of Our Salvation. The existence, nature and attributes of God. The Divine Trinity. God, the creator of the universe. Various grades of creation. The spiritual and material world. Man. Relation of different orders of creation to one another. God, the Redeemer of fallen man. Decree and plan of redemption. The Redeemer—one person and two natures. The work of redemption. Two hours. First semester. One unit.

102. The Plan of Redemption as Realized in Individuals. Grace, actual, habitual or sanctifying. The Sacraments as a means of Grace. The Sacraments are studied in general—their matter and form; their efficacy and the dispositions requisite to receive them validly and with fruit. Then each Sacrament is studied in detail. The Church as a means of salvation. The four last things. Two hours. Second semester. One unit.

103. Christian Morals in General. Law as the objective norm of human actions. Conscience as the subjective norm of human actions. The conditions of morality. Moral good and moral evil. Two hours. First semester. One unit.

104. Christian Morals in Particular. The Christian's duties toward God—Faith, Hope, Charity. Religion. Direct and indirect acts of worship. The Church as the controller of religious worship. Duties towards ourselves and our neighbor—general and particular. Works of Supererogation or Christian Perfection. Two hours. Second semester. One unit.

SCIENCE

BIOLOGY

Courses for Undergraduates

1. General Zoology. An introductory course designed to lay a broad foundation of the general principles of biology as a part of a liberal education, as a preparation for the study of medicine, or for advanced work in science. Structure, life histories, and physiology of typical animals are studied in the laboratory. Two hours Lecture; two hours Laboratory. First semester. Three units.

2. General Zoology. A continuation of Course 1. Two hours Lecture; two hours Laboratory. Second semester. Three units.

3. Embryology. Cell division, spermatogenesis, ovogenesis, fertilization, cleavage, gastrulation and the origin of the germ layers of various invertebrates and vertebrates. The study of the development of the different systems. The laboratory work includes a study of chick embryo living specimens, 24-72 hours of incubation. A study of chick embryo whole mounts up to 72 hours. A study of serial, cross and sagittal sections of chick embryo up to 72 hours. Two hours Lecture; four hours Laboratory. First semester.

Prerequisite: Biology 1, 2. Four units.

4. Comparative Anatomy. Comparative studies of adult forms, their organs and organ systems. The laboratory work is devoted to the critical dissection of the cat, and dog fish. Two hours Lecture; four hours Laboratory. Second semester. Four units.

11. General Biology. A semester course designed to meet the needs of students not following the premedical course. It deals with living plants and animals in relation to their organic and inorganic surroundings. Three hours Lecture; two hours Laboratory. One semester. Four units.

12. Human Physiology. General view of the structure and functions of the human body. The organs of circulation. Blood and lymph. Respiration. Sources of loss and gain to the blood. Alimentation. Motion and locomotion, special attention being given to the various kinds of muscles, joints, and to the various movements of the body. Sensory organs. The nervous system. Four class hours. Second semester. Four units.

The courses in General Biology and Human Physiology are designed primarily to meet the needs of the students following the course in Physical Education.

CHEMISTRY

1. Elementary Inorganic Chemistry. Discussion of elementary laws and principles. Properties of the more important elements and their compounds. Open to all students. Two hours Lecture. First semester. Two units.

2. Elementary Inorganic Laboratory. Laboratory course to accompany Chemistry 1. Illustrating fundamental laws and principles. Four hours Laboratory. First semester. Two units.

3. General Inorganic Chemistry. A continuation of Chemistry 1. Review of elementary principles and properties of the more important elements with their compounds. Includes a systematic study of important theories. Two hours Lecture. Second semester.
Prerequisite: Chemistry 1, 2. Two units.

4. General Inorganic Laboratory. Laboratory course to accompany Chemistry 3. Four hours Laboratory. Second semester.
Prerequisite: Chemistry 1, 2. Two units.

103-104. Physical Chemistry. Lectures covering the field of physical chemistry, with special emphasis upon the applications to biology; laboratory work consists of exercises in the practice of physical-chemical measurements. Two hours. lecture and four hours laboratory. One semester.
Prerequisite: Chemistry 101-102. Four units.

21. Organic Chemistry. A study of the compounds of carbon and their derivatives. The properties of the more important compounds are discussed, special attention is given to the alphatic series. Two hours lecture. Both semesters.
Prerequisite: Chemistry 1-4. Four units.

22. Organic Chemistry Laboratory. Laboratory course accompanying Chemistry 21. The typical cyclic and acyclic compounds are prepared and their properties investigated. Four hours Laboratory. Both semesters.
Prerequisite: Chemistry 21. Four units.

Courses for Advanced Undergraduates

101. Quantitative Analysis. Gravimetric and volumetric analysis. The work is regarded as preliminary training for more advanced work. Special attention is given to stoichimetrical relations and the application of the fundamental laws of chemistry to qualitative analysis. One hour Lecture. Second semester.

Prerequisite: Chemistry 13, 14. Four units.

102. Quantitative Analysis Laboratory. Laboratory course to accompany Chemistry 23. Four hours Laboratory. Second semester.

Prerequisite: Chemistry 21, 22. Two units.

GEOLOGY

Courses for Undergraduates

1. General Geology. A popular course of visual instruction to give the student an intelligent appreciation of the physiographic relief features of the earth and an insight into the probable conditions of the origin and formation of various geologic phenomena. Course consists in lectures, stereoptican projections, and supervised discussion. Two periods. One semester. Two units

2. Historical Geology. Visual instruction regarding theories of earth formation. Paleontology. Special study of fossils with access to large museum. Lectures on geologic aspects of Evolution. Two periods. One semester. Two units.

PHYSICS

Courses for Undergraduates

1. Mechanics, Molecular Physics, Sound. General principles of matter. General properties of Bodies. Equilibrium. Gravity. Pendulum. Properties peculiar to Solids. Capillarity. Hydro-dynamics. The properties of gases. Aerodynamics. Production, propagation and reflection of sound. The physical theory of music. Three hours Lecture. First semester. Carhart's College Physics.

Three units.

2. Physical Laboratory. Laboratory course to accompany Physics 1. Two hours Laboratory. First semester. One unit.

3. Light, Heat, Electicity. Transmission, velocity and reflection of light. Mirrors. Lenses. Dispersion and achromatism. Optical instruments. The eye. Double refraction. Interference and polarization. Properties of magnetism. Laws of magnetic action. Terrestrial magnetism. Quantitative laws of electric action. Distribution. Electro-static induction of influence. Electric machines. Condensation of electricity. Voltaic cell. Its modifications. Magnetic field due to current. Galvonometers. Ohm's law. Conversion of

electric energy into heat. Thermo-electricity. Electro-dynamics. Electro-magnets. Magnetization of iron. Telegraphy. Electro magnetic induction. Passage of electricity through gases. Magneto and dynamo-electric machines. Dia-magnetism. Connection between electricity and light. Carhart's College Physics. Three hours Lecture. Second semester.

Prerequisite: Physics 1, 2. Three units.

4. Physical Laboratory. Laboratory course to accompany Physics 3. Two hours Laboratory. Second semester.

Prerequisite: Physics 1, 2. One unit.

Courses for Advanced Undergraduates and Graduates

104. Electrical Measurements. A laboratory course in Electrical Measurements intended primarily for students of Electrical Engineering. Two hours Laboratory. One semester.

Physics 13, 14. One unit.

121. Astronomical Physics. A laboratory course in the study of Astronomical, Meteorological and Seismological phenomena in connection with the Observatory. Hours and credits to be arranged.

Prerequisite: One year of Physics and two years of Mathematics.

COLLEGE OF BUSINESS ADMINISTRATION

COLLEGE OF BUSINESS ADMINISTRATION

GENERAL STATEMENT

The College of Business Administration aims to train students to meet the general as well as specific problems of modern industry.

A knowledge of accounting, banking, credit, labor conditions, marketing, insurance, statistics, business organization and administration and of business law is essential for anyone who aspires to take part in the organization and management of our modern specialized industrial system.

The studies in ethics, logic, psychology, history and science, provide the student with the broader fundamental principles necessary for dealing with the industrial system in its social relationships.

Extreme specialization is not aimed at in the College of Business Administration, although each student is required to select a major in one of the three basic departments, i. e., courses relating specifically to Business Organization and Management, Finance or Accounting.

Regardless of the department selected for a major all students are required to include in their curriculum a sufficient number and diversification of courses to provide a comprehensive preparation for general business problems.

KENNA HALL

The College of Business Administration is located on the main floor of the new Kenna Hall, with class-rooms, accounting and statistical laboratories, library and club rooms, and offices.

BUSINESS ADMINISTRATION ASSOCIATION

The Business Administration Association, composed of students and faculty in the College of Business Administration, supplements the class work by regular meetings for the discussion of business problems, and by occasional social gatherings.

BUSINESS LECTURES

Throughout the year a series of lectures is given by business and public men of prominence on various problems of interest to the student body. These lectures bring the students into personal contact with representative business men and also enable them to become familiar with practical business problems.

INSPECTION TRIPS

The close connection of the University with the business and industrial establishments of the San Francisco Metropolitan district enables the faculty to arrange various inspection trips to such industries as may be of interest. In this way students are given a practical insight into the business organization and working of representative industries.

GRADUATION

The curriculum of the College of Business Administration extends over four years and leads to the degree of Bachelor of Commercial Science (B. C. S.).

The work in this college is divided into lower division and upper division work.

Graduation from this college requires the completion of 124 units of college work of which 64 units constitute the amount required in the University for the junior certificate, and at least 60 of which are required in upper division.

LOWER DIVISION

The requirements for the junior certificate in the College of Business Administration are as follows:

1. The successful passing of Subject A, prescribed in all departments of the University.

2. The equivalent of 9 units in one of the following languages: Greek, Latin, French, Spanish, Italian, or German.

3. The successful completion of the following courses which are specifically required in the lower division:

English	6 units
Religion	4 "
Logic	4 "
Philosophy	6 "
Modern Languages	9 "
Mathematics of Investment	4 "
Principles of Economics (B. A. 1A and 1B)	6 "
Modern European History	6 "
Natural Sciences	8 "
Accounting (B. A. 10A and 10B)	8 "
Economic Geography (B. A. 3A)	3 "
Introduction of Business (B. A. 18)	2 "
Physical Education	1 "

The prerequisite for Mathematics of Investment is Advanced Algebra, (taken in the University) or two full years of high school algebra. If a student has only one and one-half years of high school algebra it will be necessary for him to begin his University work with Advanced Algebra, from which he will pass to Mathematics of Investment.

SCHEDULE OF COURSES

Freshman Year

First Semester	Units	Second Semester	Units
English (Eng. 1)	3	English (Eng. 2)	3
Logic (Philos. 1)	2	Logic (Philos. 2)	2
Modern Language	3	Modern Language	3
Advanced Algebra (Math. 3)	3	Mathematics of Investment (Math. 8)	4
History (History 1)	3	History (History 2)	3
Religion (Religion 1)	1	Religion (Religion 2)	1
Intro. to Business	2	Econ. Geog. (B. A. 3-A)	3
Physical Education	½	Physical Education	½

Sophomore Year

Philosophy (Philos. 3)	3	Philosophy (Philos. 4)	3
Accounting (B.A. 10 A)	4	Accounting (B.A. 10 B)	4
Prin. of Economics (B.A. 1A)	3	Prin. of Economics (B.A. 1B)	3
Modern Language	3	Economic History	3
Natural Science	4	Natural Science	4
Religion (Religion 3)	1	Religion (Religion 4)	1

UPPER DIVISION

The requirements for graduation in addition to those for the junior certificate are as follows:

Philosophy	12 units
Religion	4 units
Commercial Law	10 units
Statistics and Graphic Methods	5 units
Advanced Economics	3 units
Technical subjects	24 units
Total	58 units

Candidates for a degree must submit a thesis on their major or allied subject for which one unit credit shall be given.

The technical subjects represent practical and theoretical courses on business subjects given in the College of Business Administration.

DESCRIPTION OF COURSES

The courses in the College of Business Administration are numbered as follows:

Numbers 1 to 99 inclusive denote lower division courses.

Numbers 100 to 199 inclusive denote upper division courses.

B. A. (Business Administration) is the title of all courses.

Courses for Undergraduates

B. A. 1A-1B. Principles of Economics. Required for all upper division work in the College of Business Administration. Two semesters.

Prerequisite: Sophomore standing. Three units each semester.

B. A. 3A. Economic Geography. An introduction to the areal background of human activities. Climatic, land, and space relationships considered in their relation to human activities. Map studies are afforded by the selection of type areas. First semester.

Three units.

B. A. 5. Mathematics of Investment. A course covering the mathematical principles upon which interest, discount, annuities, bond issues, depreciation, life insurance, and mine valuation are based. Second semester. Four units.

B. A. 10-A. Principles of Accounting. A study of the basic principles of modern accounting with particular emphasis on the mechanical and technical aspects of recording actual business transactions. First semester.

Prerequisite: Sophomore standing. Four units.

B. A. 10B. Principles of Accounting. A continuation of B. A. 10-A. Special attention is given to the theory upon which modern accounting is based. Second semester.

Prerequisite: B. A. 10-A. Four units.

B. A. 15. Economic History of Europe. A general survey of the economic development of Europe from the eleventh century to modern times, with special emphasis upon the growth and development of English industry and commerce. First semester.

Three units.

B. A. 16. Economic History of the United States. A study of the economic development of the United States with special reference to the labor problems arising from the rapid growth of the factory system in industry. Second semester. Three units.

B. A. 18. Introduction to Business. A course designed to give the student a view of business in its entirety before studying the details in advanced work. Also to connect with his new studies in business procedure, the courses in sciences and arts pursued in preparatory school and in his first two semesters in college. First semester. Two units.

Courses for Advanced Undergraduates and Graduates

B. A. 100. Statistical Methods. Covers methods of presenting statistical information, averages, the effect of chance on the reliability of statistical data and correlation as applied to economic statistics. Second semester. Four units.

B. A. 101. Economic Theory. Advanced study of the principles of demand and supply including costs; of the functions of the different agents of production; of wages; interest, rent and profits; and of the means for promotion of welfare. Recommended as a course for seniors. Either semester. Two units.

B. A. 103. Graphic Methods. A laboratory course in drawing graphs to present business information in concise forms. One two-hour laboratory period per week. First semester. One unit.

Finance Group

B. A. 120. History of Public Finance and Taxation. A survey of Public Finance and Taxation in the United States from colonial times to the present. First semester. Two units.

B. A. 121. Corporation Finance. Deals with the simpler forms of business organization; partnerships, joint stock companies, trusts, etc., leading up to a more detailed study of the modern corporation. Methods of organization and management, corporate securities and intercorporate relations are covered. First semester. Three units.

B. A. 122. Principles of Money and Banking. Approximately one third of the course is devoted to a study of money; its history, kinds of, functions, and systems of in the United States. The remainder of the course is devoted to a general consideration of banking with emphasis upon the National Banking System and the Federal Reserve System. First semester Three units.

B. A. 123. Investments. The relative merits of the various types of investments, from the point of view of the individual or private investor. Second semester. Three units.

B. A. 124. Advanced Money and Banking. A furthering of the work begun in course 122. The theories of money and of banking systems are explained. Foreign banking and currency systems come in for consideration, but the emphasis in the course is placed upon the Federal Reserve System as it is operated at the present time. Second semester.

Prerequisite: Course 122. Three units.

B. A. 125. Elements of Foreign Exchange. The methods of banking and financing followed in international trade. Detailed consideration of the commercial paper used in foreign trade, such as checks, drafts, bills, etc. Also considers gold movements between countries and their effects on currency, banking and general business. Second semester.

Prerequisite: Course 122. Three units.

B. A. 126. Business Cycles. A study of the history of periods of business depression and prosperity; phenomena attending such fluctuations; and a consideration of various means which have been suggested for the attainment of a greater degree of stability in business. Second semester.

Prerequisite: Course 122 and Course 100. Three units.

Accounting Group

B. A. 130A-130B. Accounting Problems. A study of the preparation of various types of financial statements and the problems peculiar to partnerships, corporations, and insolvent concerns. Illustrative problems solved and discussed. Two semesters.

Prerequisite: Course 10B. Three units each semester.

B. A. 132. Auditing. A study of the methods of procedure in modern auditing practice and the theories upon which they are based. First semester.

Prerequisite: Course 10-B. Two units.

B. A. 133. Industrial Accounting. An analysis of the various methods of allocation of costs and overhead in modern industry. Second semester.

Prerequisite: Course 10B. Two units.

B. A. 135. Managerial Accounting. A course in the methods of interpreting the information found in a modern set of books of account and the statements prepared therefrom. First semester.

Prerequisite: Course 10B. Three units.

B. A. 139. Federal Income Taxes. Actual preparation of individual and corporation tax returns as required under the present internal revenue laws. The current revenue laws and the regulations issued thereunder form the basis of the course. Second semester.

Prerequisite: B. A. 10-B. Three units.

Organization and Management Group

B. A. 140. Business Organization. Organization of business enterprises; private and legal aspects; their evolution; process of organizing; individual proprietor; partnership; joint stock company; corporations. First semester. Three units.

B. A. 141. Business Management. General principles of management; executive department; major problems of administration and control; general manager; departmental interrelation; divisional supervision; routine and discipline; purchasing and receiving; store systems; etc. Second semester.

Prerequisite: Course 140. Three units.

B. A. 142. Marketing. The nature and importance of marketing; producer and consumer clarifications; extent of and forces behind markets; marketing functions; cooperative marketing; methods of retail and wholesale distribution; the transportation problems connected with marketing; market price; government authority; trend of marketing methods and policies at present. First semester. Three units.

B. A. 143. Marketing of Agricultural Products. The study of the marketing functions, with particular emphasis to the application of same to agricultural products. Wholesaling of farm products. Middlemen of the agricultural wholesale market. Cooperation in the marketing of agricultural products. A study of the history, development of California coopertive marketing enterprises. The future of producers cooperatives. Marketing channels through which farm products may be directed. The financing and physical distribution. Risk bearing. Demand creation. The study of the various grain, cotton and fruit exchanges. Hedging and its significance in agriculture. Agricultural products and the world market. One semester. Three units.

B. A. 144. Principles of Advertising. The theory and practice of advertising; study of the mediums of advertising and preparation of copy. First semester.

Prerequisite: Course 142. Three units.

B. A. 145. Salesmanship and Sales Management. The principles and practice of personal salesmanship; the principle of sales management; methods of employing, training, paying, and supervising salesmen; management of sales campaigns. Second semester.
Prerequisite: Course 142. Three units.

Labor and Personnel

B. A. 150. Labor Economics. A study of the development of the labor situation in the United States, the forms, aims, and methods of action of present day labor organizations, and legislation on labor matters. Either semester. Three units.

B. A. 155. Industrial Personnel. A study of the methods of establishing and maintaining an efficient working force in industry. Covers employment methods, care of health in industry, wage payment plans, training of workers, etc.
Prerequisite: Courses 140 and 141. Three units.

Insurance

B. A. 160. Principles of Insurance. Origin and forms of insurance; its place in modern industry and society. Separate considerations of such forms as fire, life, theft, indemnity and accident, etc. First semester. Two units.

Transportation

B. A. 170. Railroad Transportation. The development, operation and regulation of the railroads; the relation of the railroads to motor truck and water transportation; rate making; public utility valuation; the question of government ownership. First semester. Three units.

Foreign Trade

B. A. 180. Principles and Methods of International Trade. Economic theory of international trade; significance of foreign trade, merchant marine, and port development; national policies affecting international commerce; export and import methods; export organization; governmental assistance. Second semester. Three units.

B. A. 181. Trade Relations of the Pacific Rim. A survey of the nations bordering on the Pacific Rim. The topographical features of each of the countries—relation of this to trade. Character of the people, institutions, habits and customs of the various peoples of the Pacific. The economic resources of the Pacific. History of the trade of this area. Present tendencies and future development of the Pacific

trade. The competition of the leading ports of the south Pacific and the north Pacific coast of the U. S. A study of the leading exports and imports of each nation with the U. S. and with other parts of the world. The effects of the Panama Canal on trade. Buying power of the peoples and how this may be developed in different nations. An analysis of the shipping passing through the Pacific coast ports of the U. S. and the effects upon these ports. One semester. Three units.

COMMERCIAL LAW

1. Contracts. Elements of a contract; parties; consideration; illegal and void contracts; construction; verbal and written contracts; Statute of Frauds; termination; breach; damages. First semester. Two units.

2. Negotiable Instruments, Sales. Bills, notes, drafts and checks; acceptance of drafts; certified checks; rights and liabilities of endorsers; presentment; notice of dishonor; protest.

Sales: the contract of sale; immediate and future sales; rights and duties of consignee, consignor and carrier; stoppage and loss in transit; setting aside sales; warranties. Second semester. Two units.

3. Agency, Bailments and Carriers. Who may be agents and how appointed; rights and duties of agents and principals in reference to each other and third parties; termination.

Bailments: nature and classification; innkeepers. Common carriers; carriers and passengers; of goods; telegraph and telephone companies. First semester. Three units.

4. Partnerships and Corporations, Bankruptcy. Articles of copartnership; rights of partners against each other; rights of creditors against firm and partners; kind of partners; termination; liquidation of assets. Corporations: charter and by-laws; stockholders' and directors' meetings; forms of corporate stock; elections; ultra vires acts; directors' and stockholders' liabilities; rights of creditors; dissolution.

Bankruptcy: Who may become bankrupts; exemptions; duties; compositions; discharge; offenses against bankruptcy law; trustees and referees; preferred creditors. Second semester. Three units.

COURSES IN THE COLLEGE OF LIBERAL ARTS TAKEN BY STUDENTS IN THE COLLEGE OF BUSINESS ADMINISTRATION

For additional courses and full description see Bulletin, College of Liberal Arts.

ENGLISH

1. Freshman Rhetoric. A study of the principles of literary art, with special attention to the mechanics of writing. Accompanied by a survey course in English Literature. Practice writing in prose composition. Three hours. One semester. Three units.

2. Introduction to the Study of Poetry. Its nature and kinds. Practice writing in verse composition in imitation of authors read. Accompanied by survey course in English literature. Three hours. One semester. Three units

HISTORY

1. European History. The Renaissance and the Protestant Revolution. An elementary course in European History. Three hours. First semester. Three units.

2. European History. The Catholic Revival to the French Revolution. A continuation of History 1. Three hours. Second semester. Three units.

MATHEMATICS

3. College Algebra. A course containing the usual matter and methods of Advanced Algebra, special attention being given to graphical methods. Three hours. One semester. Three units.

8. Mathematical Theory of Investment. A course in the fundamentals in the mathematics of business. Three hours. Second semester.

Prerequisite: Mathematics 3. Three units.

MODERN LANGUAGES

FRENCH

1. Elementary French. The elements of grammar. Three hours. First semester. Three units.

2. Elementary French. A continuation of French 1. Three hours. Second semester.

Prerequisite: French 1. Three units.

3. Intermediate French. A continuation of French 2. Three units. First semester.

Prerequisite: French 2. Three units.

4. Intermediate French. A continuation of French 3. Three hours. First semester.
Prerequisite: French 3. Three units.

GERMAN

1. Elementary German. Elements of German Grammar. Drill in pronunciation. Vocabulary. Three hours. First semester. Three units.

2. Elementary German. A continuation of German 1. Three hours. Second semester.
Prerequisite: German 1. Three units.

3. Intermediate German. A continuation of German 2. Reading from technical German works. Three hours. First semester.
Prerequisite: German 2. Three units.

4. Intermediate German. A continuation of German 3. Advanced reading and writing of technical German. Three hours. Second semester.
Prerequisite: German 3. Three units.

ITALIAN

Courses for Undergraduates

1. Elementary Italian. Elements of Italian Grammar. Three hours. First semester. Three units.

2. Elementary Italian. A continuation of Italian 1. Three hours. Second semester.
Prerequisite: Italian 1. Three units.

3. Intermediate Italian. A continuation of Italian 2. Reading of more difficult Italian prose. Three hours. First semester.
Prerequisite: Italian 2. Three units.

4. Intermediate Italian. A continuation of Italian 2. Reading of Italian prose. Three hours. Second semester.
Prerequisite: Italian 3. Three units.

SPANISH

1. Elementary Spanish. Elements of Spanish Grammar. Three hours. First semester. Three units.

2. Elementary Spanish. A continuation of Spanish 1. Three hours. Second semester.
Prerequisite: Spanish 1. Three units.

3. Intermediate Spanish. Continuation of Spanish 2. Reading of advanced Spanish prose. Three hours. Second semester.
Prerequisite: Spanish 2. Three units.

4. Intermediate Spanish. A continuation of Spanish 3. Reading of advanced Spanish prose. Three hours. Second semester.
Prerequisite: Spanish 3. Three units.

PHILOSOPHY

1. Logic: Dialectics. The first principles of Logic. Two hours. First semester. Two units.

2. Logic: Critics. A continuation of Philosophy 1. Two hours. Second semester.
Prerequisite: Philosophy 1. Two units.

3. General Metaphysics. Ontology. Fundamental aspects of being. Three hours. One semester.
Prerequisite: Philosophy 2. Two units.

4. Metaphysics. The Cause. The Universe and Matter. Life. Three hours. Second semester.
Prerequisite: Philosophy 3. Three units.

101. Psychology. The general aspects of rational psychology. Nature of the human soul. Three hours. August to February.
Prerequisite: Junior standing. Three units.

102. Theodicy. Proofs of the existence of God; His essence and attributes. Three hours. February to May.
Prerequisite: Philosophy 101. Three units.

103. Fundamental Ethics. Nature of the moral act. Moral good and moral evil. Four hours. One semester.
Prerequisite: Philosophy 102. Four units.

104. Applied Ethics. Application of general principles of ethics to particular social rights and obligations. Rights of property, life, honor. Civil Society. Domestic Society. Four hours. One semester.
Prerequisite: Philosophy 103. Four units.

POLITICAL ECONOMY

For description of the courses in Political Economy see courses in Business Administration.

PUBLIC SPEAKING

1. Fundamentals of Expression. A fundamental course in Expression. Two hours. First semester. One unit.

2. Fundamentals of Expression. A continuation of Public Speaking 1. Two hours. Second semester.
Prerequisite: Public Speaking 1. One unit.

CHEMISTRY

1. General Inorganic Chemistry. An elementary course in the fundamentals of Chemistry. Two hours Lecture. First semester. Two units.

2. General Inorganic Chemistry Laboratory. A laboratory course to accompany Chemistry 1. Four hours Laboratory. First semester. Two units.

3. General Inorganic Chemistry. An elementary course in the fundamentals continuing Chemistry 1. Two hours Lecture. Second semester.
Prerequisite: Chemistry 1, 2. Two units.

4. General Inorganic Chemistry Laboratory. A laboratory course to accompany Chemistry 3. Four hours laboratory. Second semester.
Prerequisite: Chemistry 1, 2. Two units.

PHYSICS

1. Mechanics, Molecular Physics, Sound. An elementary course in the principles of Physics. Three hours Lecture. First semester. Three units.

2. Physical Laboratory. Laboratory course to accompany Physics 1. Two hours Laboratory. First semester. One unit.

3. Light, Heat, Electricity. A continuation of Physics 1. Three hours Lecture. Second semester.
Prerequisite: Physics 1, 2. Three units.

4. Physical Laboratory. Laboratory course to accompany Physics 3. Two hours Laboratory. Second semester.
Prerequisite: Physics 1, 2. One unit.

COLLEGE OF ENGINEERING

COLLEGE OF ENGINEERING

INTRODUCTION

The foundation of the College of Engineering in the University of Santa Clara was the result of repeated and urgent requests that opportunities should be given young men ambitious to follow the Engineering profession, to pursue and complete the studies leading to it in an environment and atmosphere conducive as well to deep persevering study as to cultural and moral development.

To meet this demand, the Faculty of the University has added sound and thorough courses in Chemical, Civil, Electrical and Mechanical Engineering. As in all other departments of the University, the students are under the moral guidance of the Jesuit Fathers. The technical work of these departments is in the hands of experienced and practical engineers who devote their whole time and attention to the success of their work. As is traditional at Santa Clara, students in Engineering are given individual care, assistance, advice and encouragement. The work exacted is of the highest type; nevertheless, owing to this individual care and to the judicious admission of students as well as the prompt elimination from the various departments of students found to be inadequately prepared in fundamental studies or in seriousness of purpose, there is very little likelihood and no excuse for failure on the part of the student.

The engineer today must be more than a machinist, electrician or surveyor. He can no longer be a self-made man in the old sense. His mind must possess the acumen and culture which only a broad college training and college association can give, and his acquaintance with and love of mathematics and science should be the foundation on which his knowledge of their technical application is based.

This is the ideal which Santa Clara cherishes for the engineers who shall receive their education from her, and the notable work which her graduates are doing proves that this ideal leads to success.

COURSES—DEGREES

Courses are offered leading to the degrees of Bachelor of Science in Chemical Engineering, Bachelor of Science in Civil Engineering, Bachelor of Science in Electrical Engineering and Bachelor of Science in Mechanical Engineering. These courses aim, first, to give the student a thorough knowledge of the sciences on which all Engineering is based; secondly, to develop his ability to acquire accurate information; thirdly, to develop his judgment by practical work so that he may be able to use his knowledge and information to the best advantage.

Chemical Engineering is concerned with the design, construction and operation of plants to carry out chemical processes on a commercial scale. It is applied in such industries as sugar, rubber, dye and chemical manufacturing.

Civil Engineering covers the field of structural work (steel, concrete and stone buildings and bridges), municipal engineering (roads, pavements and sewers), water power development, irrigation and railroad construction. These are all based on the fundamental sciences of Mathematics, Physics and Chemistry, and as much practice as possible is given to facilitate the application of these sciences to professional work.

Electrical Engineering has to do with the design and construction of electrical machinery and the various applications of electricity to the arts. Electrical and Mechanical Engineering are so closely interrelated that the courses of the first three years are the same, and it is only the Senior courses, such as Telephony and pure Electrical design that are differentiated from the Mechanical Engineering courses.

Mechanical Engineering may be divided into three closely related lines, Design, Manufacturing and Power Generation. The courses in Design begin with mechanical drawing and continue with a study of mechanisms, strength of materials, stresses, adaptability, cost, and commercial worth of machines. Manufacturing has to do with the organization of commercial enterprise, systems of works management, efficiency systems, cost of materials and power and layout of machinery in a factory for maximum output. The subject of Power Generation is covered by courses on steam and gas engines, turbines, boilers, water motors and electric generators, together with the proper operation of all classes of machinery and the application of power to them.

GRADUATE DEGREES

For the degrees of Chemical Engineer (Ch. E.), Civil Engineer (C. E.), Electrical Engineer (E. E.), and Mechanical Engineer (M. E.), it is required that the candidate be a graduate in the College of Engineering of this University who has been engaged in acceptable professional work for a period of not less than three years after receiving the Bachelor's degree. Candidates for these degrees must declare their candidacy and file with the Dean of the College of Engineering a detailed statement covering their professional study and experience and an outline of their proposed thesis not later than December 31st preceding the commencement at which they wish to receive the degree, and they must submit the completed thesis not later than one month prior to the date fixed for the annual conferring of degrees.

ALUMNI SCIENCE HALL

The College of Engineering occupies the entire second floor of the new, reinforced concrete Alumni Science Hall; with offices, class rooms, drafting rooms, road and calorimeter laboratories, blue-print room, and library. The Physical and Chemical lecture rooms and laboratories are immediately adjacent on the other floors.

MONTGOMERY LABORATORIES

The Montgomery Laboratories, a new concrete building, houses the various engineering laboratories, including forge, wood shop, and pattern laboratories, materials testing laboratory, electrical laboratory, mechanical laboratory, offices, and class rooms for laboratory classes.

ENGINEERING SOCIETY

The Engineering Society, composed of students and faculty in the College of Engineering, supplements the class work by regular meetings for the discussion of engineering problems, with special lectures by engineers of prominence; by occasional social gatherings; and by such other student activities as are found advisable.

INSPECTION TRIPS

One important advantage of the University is its proximity to the many industrial establishments of the San Francisco metropolitan district and this opportunity is taken advantage of by special trips to special industries. In this way students are given a practical insight into the working of these engineering industries.

STUDENT BRANCHES:

AMERICAN SOCIETY OF MECHANICAL ENGINEERS
AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

Student branches of the A. S. M. E. and A. I. E. E. have been established at the University, and are open to students of Mechanical and Electrical Engineering for the discussion of current problems.

REQUIREMENTS FOR GRADUATION

In all groups of the College of Engineering, 152 credits are required for graduation. A credit is given for each one-hour recitation, or lecture, per week, carried satisfactorily for one semester, or for two hours per week spent in laboratory, drawing room or shop. All regular students free from deficiencies in university work may register for 19 units of new work.

At least two summer vacations must be spent on engineering work least three hundred words, must be handed to the Dean of the Col-

before graduation. A detailed report of this work, containing at lege of Engineering within one month of the opening of the first semester.

Before one is admitted to any degree a thesis must be submitted on a subject chosen by the student with the approbation of the Dean of the Faculties. It must bear on the matter studied or at least on cognate matter and must give evidence of original investigation of some engineering problem. It shall consist of no fewer than 5000 words and should be typewritten on paper 8½x11 inches. The submission of an acceptable thesis is an absolute prerequisite to admission to final examinations. The ultimate decision as to whether the effort merits the degree rests with the Committee on Theses.

Residence of at least one year immediately preceding graduation is required for the granting of any degree.

SCHEDULE OF COURSES

CHEMICAL ENGINEERING

Freshman Year—First Semester

	Hours Attendance		Units
	Recitation	Laboratory	
College Algebra (Math. 11) } Trigonometry (Math. 12) }	5		5
Chemistry (Chem. 11, 12)	2	4	4
Mechanical Drawing (G. E. 1)		6	3
English (Eng. 11)	3		3
Public Speaking (Pub. Speak. 11)	1		1
Review of Engineering Industries (G. E. 9)	1		1
Shopwork (M. E. 10)		2	1
Religion (Religion 11)	2		1
Physical Education		2	½

Second Semester

Analytic Geometry (Math. 13)	5		5
Chemistry (Chem. 13, 14)	2	4	4
Physics (Phys. 1)	2		2
Descriptive Geometry (G. E. 2)		6	3
English (Eng. 12)	3		3
Public Speaking (Pub. Speak. 12)	1		1
Review of Engineering Industries (G. E. 9a)	1		1
Shopwork (M. E. 11)		2	1
Religion (Religion 12)	2		1
Physical Education		2	½

CHEMICAL ENGINEERING

Sophomore Year—First Semester

	Hours Recitation	Attendance Laboratory	Units
Calculus (Math. 14)	5		5
Technical Mechanics (G. E. 7)	4		4
Physics (Phy. 11, 12)	2	4	4
Chemistry (Chem. 21)	2	4	4
English (Engl. 13)	3		3
M. E. Laboratory (M. E. 15)		4	2
Religion (Religion 13)	2		1

Second Semester

Calculus (Math. 15	5		5
Technical Mechanics (G. E. 8)	4		4
Physics (Phys. 13, 14)	2	4	4
Chemistry (Chem. 22)	2	4	4
Drawing (M. E. 4)	1	4	3
English (Engl. 14)	3		3
Religion (Religion 14)	2		1

Junior Year—First Semester

Machanics of Materials (G. E. 109)	4		4
Machine Design (M. E. 105)		4	2
Boilers (M. E. 118)	2		2
Electrical Measurements (Phys. 104)		2	1
Chemistry (Chem. 101-102)	2	4	4
Electrical Engineering (E. E. 101)	3		3
E. E. Laboratory (E. E. 109)		4	2
Materials Testing Laboratory (E. E. 110)		2	1
Philosophy (Philos. 111)	3		3
Religion (Religion 111)	2		1

Second Semester

Hydraulics (G. E. 121)	3	2	4
Steam and Gas Machinery (M. E. 119)	3		3
Electrical Engineering (E. E. 101)	3		3
Machine Design (M. E. 106)	2	4	3
M. E. Laboratory (M. E. 116)		2	1
Chemistry (Chem. 103-104)	2	4	4
Philosophy (Philos. 112)	3		3
Religion (Religion 112)	2		1

CHEMICAL ENGINEERING

Senior Year—First Semester

	Hours Attendance		Units
	Recitation	Laboratory	
Thermodynamics (M. E. 120)	3		3
Industrial Engineering (M. E. 123)	2		2
Alternating Currents (E. E. 103)	3		3
Chemistry Seminar (Chem. 170)	2	4	4
M. E. Laboratory (M. E. 117)		4	2
Philosophy (Philos. 113)	3		3
Religion (Religion 113)	2		1

Second Semester

Seminar (G. E. 127)	1		1
Alternating Currents (E. E. 104)	3		3
Estimates and Specifications (G. E. 131)	2		2
Economics (Econ. 111)	1		1
Business Law (Law 111)	1		1
Thesis (Chem. 170)			4
Philosophy (Philos. 114)	3		3
Religion (Religion 114)	2		1

CIVIL ENGINEERING

Freshman Year—First Semester

College Algebra (Math. 11) Trigonometry (Math. 12)	5		5
Chemistry (Chem. 11, 12)	2	4	4
Mechanical Drawing (G. E. 1)		6	3
Public Speaking (Pub. Speak. 11)	1		1
English (Eng. 11)	3		3
Review of Engineering Industries (G. E. 9)	1		1
Surveying (C. E. 1)	1	2	2
Religion (Religion 11)	2		1
Physical Education		2	½

Second Semester

Analytic Geometry (Math. 13)	5		5
Chemistry (Chem. 13, 14)	2	4	4
Physics (Phys. 1)	2		2
Descriptive Geometry (G. E. 2)	1	4	3
English (Eng. 12)	3		3
Public Speaking (Pub. Speak. 12)	1		1
Review of Engineering Industries (G.E. 9a)	1		1
Surveying (C. E. 2)	1	2	2
Religion (Religion 12)	2		1
Physical Education		2	½

CIVIL ENGINEERING

Sophomore Year—First Semester

	Hours Attendance		Units
	Recitation	Laboratory	
Calculus (Math. 14)	5		5
Technical Mechanics (G. E. 7)	4		4
Physics (Phys. 11, 12)	2	4	4
Geology (Geol. 33)	3		3
Field Engineering (C. E. 3)	1	2	2
Drawing (C. E. 12)		2	1
English (Eng. 13)	3		3
Religion (Religion 13)	2		1

Second Semester

Calculus (Math. 15)	5		5
Technical Mechanics (G. E. 8)	4		4
Physics (Phys. 13, 14)	2	4	4
Mineralogy (Geol. 34)	3		3
Field Engineering (C. E. 4)	1	2	2
Drawing (C. E. 13)		2	1
English (Eng. 14)	3		3
Religion (Religion 14)	2		1

Junior Year—First Semester

Mechanics of Materials (G. E. 109)	4		4
Graphics (C. E. 118)	2	4	4
Differential Equations (Math. 116)	2		2
Structural Design (C. E. 114)	3	2	4
Materials Testing Laboratory (G. E. 110)		2	1
Philosophy (Philos. 111)	3		3
Religion (Religion 111)	2		1

Second Semester

Hydraulics (G. E. 121)	3	2	4
Electricity (E. E. 114)	2	2	3
Graphics (C. E. 119)	2	2	3
Masonry (C. E. 120)	3		3
Structural Design (C. E. 115)		4	2
Philosophy (Philos. 112)	3		3
Religion (Religion 112)	2		1

CIVIL ENGINEERING

Senior Year—First Semester

	Hours Attendance Recitation	Laboratory	Units
Stresses (C. E. 122)	4		4
Roads and Pavements (C. E. 124)	1	2	2
Sanitary Engineering (C. E. 125)	3		3
Concrete and Reinforced Concrete (C. E. 127)	3		3
Design (C. E. 116)	2	6	5
Philosophy (Philos. 113)	3		3
Religion (Religion 113)	2		1

Second Semester

Stresses (C. E. 123)	4		4
Economics (Econ. 111)	1		1
Business Law (Law 111)	1		1
Sanitary Engineering (C. E. 126)	3		3
Railway Construction (C. E. 130)	2		2
Estimates and Specifications (G. E. 131)	2		2
Design (C. E. 117)		4	2
Philosophy (Philos. 114)	3		3
Religion (Religion 114)	2		1
Seminar (G. E. 127)	1		1
Thesis (C. E. 170)			2

ELECTRICAL AND MECHANICAL ENGINEERING

Freshman Year—First Semester

College Algebra (Math. 11) Trigonometry (Math. 12)	5		5
Chemistry (Chem. 11, 12)	2	4	4
Mechanical Drawing (G. E. 1)		6	3
English (Eng. 11)	3		3
Public Speaking (Pub. Speak. 11)	1		1
Review of Engineering Industries (G. E. 9)	1		1
Shopwork (M. E. 10)		2	1
Religion (Religion 11)	2		1
Physical Education		2	½

ELECTRICAL AND MECHANICAL ENGINEERING

Freshman Year—First Semester

	Hours Attendance Recitation	Laboratory	Units
Analytic Geometry (Math. 13)	5		5
Chemistry (Chem. 13, 14)	2	4	4
Physics (Phys. 1)	2		2
Descriptive Geometry (G. E. 2)	1	4	3
English (Eng. 12)	3		3
Public Speaking (Pub. Speak. 12)	1		1
Review of Engineering Industries (G.E. 9a)	1		1
Shopwork (M. E. 11)		2	1
Religion (Religion 12)	2		1
Physical Education		2	½

Sophomore Year—First Semester

Calculus (Math. 14)	5		5
Technical Mechanics (G. E. 7)	4		4
Physics (Phys. 11, 12)	2	4	4
Kinematics (M. E. 3)	2		2
English (Eng. 13)	3		3
M. E. Laboratory (M. E. 15)		4	2
Shopwork (M. E. 12)		2	1
Religion (Religion 13)	2		1

Second Semester

Calculus (Math. 15)	5		5
Technical Mechanics (G. E. 8)	4		4
Physics (Phys. 13, 14)	2	4	4
Kinematics	2		2
Drawing (M. E. 4)	1	4	3
English (Eng. 14)	3		3
Shopwork (M. E. 13)		2	1
Religion (Religion 14)	2		1

Junior Year—First Semester

Mechanics of Materials (G. E. 109)	4		4
Machine Design (M. E. 105)		4	2
Boilers (M. E. 118)	2		2
Electrical Measurements (Phys. 104)		2	1
Electrical Engineering (E. E. 101)	3		3
Differential Equations (Math. 116)	2		2
E. E. Laboratory (E. E. 109)		4	2
Materials Testing Laboratory (C. E. 110)		2	1
Shopwork (M. E. 114)		2	1
Philosophy (Philos. 111)	3		3
Religion (Religion 111)	2		1

ELECTRICAL AND MECHANICAL ENGINEERING

Junior Year—Second Semester

	Hours Attendance Recitation	Laboratory	Units
Hydraulics (G. E. 121)	3	2	4
Steam and Gas Machinery (M. E. 119)	3		3
Electrical Engineering (E. E. 102)	3		3
Machine Design (M. E. 106)	2	4	4
M. E. Laboratory (M. E. 116)		2	1
Shopwork (M E. 114a)		2	1
Surveying (C. E. 132)		2	1
Masonry (C. E. 120)	3		3
Philosophy (Philos. 112)	3		3
Religion (Religion 112)	2		1

ELECTRICAL ENGINEERING

Senior Year—First Semester

Thermodynamics (M. E. 120)	3		3
Industrial Engineering (M. E. 123)	2		2
Electrical Design (E. E. 106)		4	2
Structural Design (C. E. 114)	3	2	4
Alternating Currents (E. E. 103)	3		3
E. E. Laboratory (E. E. 111)		4	2
Philosophy (Philos. 113)	3		3
Religion (Religion 113)	2		1

Second Semester

Power Plant Design (E. E. 107)	2	4	4
Alternating Currents (E. E. 104)	3		3
Electrical Design (E. E. 108)		4	2
E. E. Laboratory (E. E. 112)		2	1
Hydraulic Motors (M. E. 122)	2		2
Business Law (Law 111)	1		1
Estimates and Specifications (G. E. 131)	2		2
Economics (Econ. 111)	1		1
Seminar (G. E. 127)	1		1
Philosophy (Philos. 114)	3		3
Religion (Religion 114)	2		1
Thesis (E. E. 170)			2

MECHANICAL ENGINEERING

Senior Year—First Semester

	Hours Attendance Recitation	Laboratory	Units
Thermodynamics (M. E. 120)	3		3
Industrial Engineering (M. E. 123)	2		2
Alternating Currents (E. E. 103)	3		3
Machine Design (M. E. 107)		4	2
Structural Design (C. E. 114)	3	2	4
M. E. Laboratory (M. E. 117)		4	2
Philosophy (Philos. 113)	3		3
Religion (Religion 113)	2		1

Second Semester

Seminar (G. E. 127)	1		1
Power Plant Design (M. E. 108)	2	4	4
Alternating Currents (E. E. 104)	3		3
Electric Transmission (E. E. 115)	2		2
Estimates and Specifications (G. E. 131)	2		2
Economics (Econ. 111)	1		1
Business Law (Law 111)	1		1
Elective			2
Philosophy (Philos. 114)	3		3
Religion (Religion 114)	2		1
Thesis (M. E. 170)			2

DESCRIPTION OF COURSES

CIVIL ENGINEERING

Courses for Undergraduates

C. E. 1. Surveying. Theory, construction, use and adjustments of tape, compass, level and transit. Land and city surveying. Plotting, field work and computation of areas. Divsion of land. Simple leveling. Complete maps. Practical field work covering all matter taught in class work. The object is to familiarize thoroughly the student with the instruments and with field conditions. Field notes. Field maps. Topographical sketching without instruments. Breed & Hosmer's Principles & Practice of Surveying. Pence and Ketchum, Surveying Manual. One hour Lecture, two hours Laboratory.

Prerequisite: Math. 12. **Two units.**

C. E. 2. Surveying. Continuation of C. E. 1. Breed & Hosmer's Principles & Practice of Surveying. One hour Lecture, two hours Laboratory. Second semester.

Prerequisite: C. E. 1. **Two units.**

C. E. 3. **Field Engineering.** Leveling, contour lines, hachures, cross-section work. Use of plane table. Maps of work. Stadia. Transit Stadia. City, mine, hydrographic and topographic surveying. Engineering office work. Plotting profiles and cross-sections. Calculations of areas. Computation of volumes of earth work and masonry. Draughting field notes. Excavation methods in different materials. Estimate of cost. Overhaul. Application to canals, trenches, embankments, dredging, etc. Practical surveying in the field under all the heads in the scope of the work in class. Notes. Calculations. Conditions are made as nearly those of a corps in the field as possible, each student being required to fill every position in turn. Breed & Hosmer's Principles & Practice of Surveying. One hour Lecture, two hours Laboratory. First semester.

Prerequisite: C. E. 2. Two units.

C. E. 4. **Field Engineering.** Reconnaissance. Location, preliminary survey and grade stakes for highways, canals and railways. Plots and calculations from notes. Theory of railway curves; simple, compound and taper curves. Locating side-tracks, switches, yards. Cross sectioning. Triangulation. The work is made as nearly practical as possible and covers the theories and principles taught in class work. Breed & Hosmer's Principles & Practice of Surveying. Allen's Railroad Curves and Earthwork. One hour Lecture, two hours Laboratory. Second semester.

Prerequisite: C. E. 3. Two units.

C. E. 12. **Drawing.** Shading of lines and colors. Topographical drawing and lettering. Conventional signs, etc. Maps of work done in field. Complete maps in pencil, pen and colors. Blue prints. Tracing structural details. Daniel's Topographical Drawing. Two hours Drawing. First semester.

Prerequisite: C. E. 1. One unit.

C. E. 13. **Drawing.** Continuation of C. E. 12. Text as in C. E. 12. Two hours Drawing. Second semester.

Prerequisite: C. E. 12. One unit.

Courses for Advanced Undergraduates and Graduates

C. E. 114. **Structural Design.** The Design and Detailing of a Reinforced Concrete Retaining Wall, Culvert, Pier and Abutment, a Steel Roof Truss, a Timber Roof Truss. Full computations of stresses must be submitted together with finished drawings and estimate of quantities. Definite conditions are given from which the design must be evolved by the student. Ketchum's Structural Engineers' Handbook. Bishop's Structural Drafting. Dewell's Timber Framing. Three hours Lecture, two hours Drawing. First semester.

Prerequisite: Must be taking G. E. 110. Four units.

C. E. 115. Structural Design. Continuation of C. E. 114. Baker and Current Publications of New Structures. Four hours Drawing.
Prerequisite: C. E. 114. Two units.

C. E. 116. Design. The Design and Detailing of a Railway Plate Girder, a Steel Truss Bridge, a Reinforced Concrete Girder, and a Reinforced Concrete Arch Bridge. The actual site of each structure is assigned in each problem. Merriman and Jacoby's Roofs and Bridges Vol. 3. Hool's Reinforced Concrete Construction Vol. 3. Two hours Lecture, Six hours Drawing. First semester.
Prerequisite: Must be taking C. E. 127. Five units.

C. E. 117. Design. Continuation of C. E. 116. Second semester. Four hours Drawing.
Prerequisite: C. E. 116. Two units.

C. E. 118. Graphics. Principles and Methods. Application to roof trusses under dead, snow and wind loads. Complete stresses for triangular and crescent trusses. Unsymmetrical loads for trusses. Bridge trusses. Stress due to dead, snow, wind, initial tension and live loads. Bowstring trusses, Stress loads, Locomotive wheel loads. Plate girders. Shears. Moments. Trusses with broken chords. Miscellaneous trusses. Elastic deformation of trusses. Application to other engineering structures. Merriman and Jacoby's Graphic Statics. Two hours Lecture, four hours Laboratory. Four units.

C. E. 119. Graphics. Continuation of C. E. 118. Text as in C. E. 118. Two hours lecture, two hours Laboratory. Second semester.
Prerequisite: C. E. 118. Three units.

C. E. 120. Masonry. The Non-Metallic Materials: their strength, durability, occurrence, testing and uses. Plain Concrete: selection of aggregates, proportioning, mixing and placing for maximum strength and density. Forms. Reinforced Concrete: general principles and assumptions involved in the theory, development and application of formulae for rectangular and T beams, simple and continuous, for beading, diagonal tension, bond, etc.; plain, spiral and hooped columns. Stone and Brick Masonry. Waterproofing. Foundations on Land: bearing capacity and methods of improving it, safe loads, design and arrangement of footings, piles and pile driving, safe loads on piles. Foundations under Water: coffer dam, crib, open caisson, pneumatic, and freezing processes, dredging through wells, pumping, the effect of compressed air. Masonry Walls and Dams; lateral pressure of water and earth, stability, internal stresses, investigation, design, construction details. Bridge Abutments and Piers. Culverts. The Voussier Arch: general data, methods of failure, stability, static analysis. Baker's Treatise on Masonry Construction. Urquhart & O'Rourke's Design of Concrete Structures. Three class hours. First semester. Three units.

C. E. 122. Stresses in Structures. Roofs and Bridges. Stresses in members of roof trusses. Different types of loads. Final stresses in roof trusses. The evolution of present types of highway and railway bridge trusses. Stresses due to dead, live and wind loads, impact and traction on all members of simple bridges. Text: Merriman & Jacoby's Roofs & Bridges. Vol. 1. First semester. Four class hours. Four units.

C. E. 123. Stresses in Structures. Elementary Indeterminate forms. The properties of continuous beams and rigid frames derived from, (a) the double integration of the differential equation of the elastic line; (b) the equations derived from the laws of work, and (c) the principle of area moments. Deflections in structures with open webs. Stresses in redundant members. Arches with solid and open webs. Movable bridges. Text: Hudson's Deflections and Statically Indeterminate Stresses. Four hours. Second semester. *Prerequisite:* C. E. 122. Four units.

C. E. 124. Roads and Pavements. Different types of highways. Economic location of highways. Traction resistance. Gradients. Foundations. Preparing foundations. Drainage. Standard cross-sections. Natural, broken stone and other artificial roads. Materials and their adaptability to classes of traffic. Road coverings. Asphalts. Asphaltenes and patented road coverings. Concrete. Oils. Oiled roads. Dust prevention. Maintenance and repairs. Pavements. Paving materials. City streets. Width and cross-section, crown, gutters, curbs, footwalks and crossings. Street intersection and grades. Standard city streets and street railway construction. Repairs. Lectures on improvement and changes in highway construction. Agg's Roads and Pavements; Bulletins from Office of Public Roads, U. S. Dept. of Agriculture. One hour Lecture, two hours Laboratory. First semester. Two units.

C. E. 125. Sanitary Engineering. Rainfall and run-off. Estimating future population. Amount of sewage per capita, Ground water, Grades and Velocities, Sewerage systems, Cross-sections, Flushing. The meaning of chemical analyses of water and sewage. Bacteria and their relation to sewage disposal and water purification. Texts: Ogden's Sewer Design; Fuller's Sewage Disposal. Three hours. First semester. Three units.

C. E. 126. Sanitary Engineering. (a) Irrigation Engineering in General. Value, cost and returns. Drainage areas. Estimation of rainfall and discharge from drainage areas. Water units and duty. Stream flow and discharge. Measuring devices. Canals and ditches; construction; alignment, slope and cross-section. Distribution. Appli-

cation of water in irrigation. Storage work. Water supply and losses. Geological conditions affecting reservoir sites. Earth and masonry dams. Details of headworks, diversion, weirs, waste ways, sluices and regulators. Pumping machinery. Maintenance. Water rights. Irrigation laws. Newell and Murphy's Principles of Irrigation Engineering.

(b). **Water Supply.** Drinking water and disease. Artificial methods of water purification. Natural purification. Properties of waters from Snows, Rivers, Lakes or reservoirs, Wells, etc. Per capita consumption. Texts: Newell & Murphy's Principles of Irrigation Engineering; Mason's Water Supply. Three class hours. Second semester. Three units.

C. E. 127. **Reinforced Concrete.** The Chemistry and Testing of Cements and Aggregates. A short review of: Voids and Other Characteristics of Aggregates; Laying Concrete and Mortar in Freezing Weather; the effect of Sea water and other Destructive Agencies; Water tightness and Strength of Concrete. Advanced Theory and formulae for:—Members under flexure and direct stress; Hollow and Wedge shaped beams; Flat slabs; Rigid frames; Temperature, shrinkage and settlement stresses. A critical and comprehensive review of the principal tests made on reinforced concrete structures intended to develop the student's judgment and lead to a clear understanding of modern design specifications. Specifications for the Design of Reinforced Concrete. Building Codes. Building Construction. Beam and Girder Bridges. The Elastic Arch. Taylor & Thompson's Concrete, Plain and Reinforced. Hool's Reinforced Concrete Design, Vol. III. Three hours. First semester. Three units.

C. E. 128. **Tunneling.** Classification of tunnels. Locating tunnels. Economic location. Different methods employed in tunnels under various soil conditions. Excavating. Removal of excavations. Blasting. Powders. Drills and machinery used. Economic distribution of forces. Heading and bench. Linings in wood, brick, concrete and reinforced concrete. Drainage. Ventilation. Rapid transit system. City subway work and methods. Stauffer: Modern Tunnel Practice. Two class hours. First semester. Two units.

C. E. 130. **Railway Construction.** Much of the course is also adapted to the construction of canals, highways, levees, etc. Reconnaissance. Location. Alignment, grade and distances. Parties. Staking out work. Grading. Organization of grading parties. Methods of grading. Machines, etc. Output of men, animals and machines. Volumes. Cut and fill. Overhaul. Finishing. Revetments. Drainage, areas and waterways. Culverts, size and character. Track-

laying. Tracklaying machines. Surfacing. Ballast. Single and double track roads. Side tracks, switches, crossings and yards. Round Houses. Shortening lines. Operating expenses. Maintenance. General land extra gangs. Camp hygiene. Right of way. This course is largely lecture work, using standard text-books and writings. Raymond's Railway Engineering. Two class hours. Second semester. Three units.

C. E. 132. Surveying. Use and adjustment of tape, level and transit. For Electrical and Mechanical Engineers. Pence & Ketchum's Surveying Manual. Two hours Laboratory. Second semester. One unit.

C. E. 170. Thesis and Seminar. Original investigation of some Engineering problem.

ELECTRICAL ENGINEERING

Courses for Undergraduates

11. Electricity. Definitions. Coulomb's Law. Electromagnetism. Ohm's Law. Electric circuits and resistance. Generators. Motors—Losses, Heating and Efficiency. Gray's Principles and Practice of Electrical Engineering. Two class hours. One semester.
Prerequisite: Sophomore standing. Two units.

Courses for Advanced Undergraduates and Graduates

E. E. 101. Electrical Engineering. Magnetic field. Magneto-motive force. Hysteresis. Elementary dynamo. The magnetic circuit. Armature core. Commutator. Brush shifting. Sparking at brushes and remedies. Different types of generators. Methods of transmitting, distributing and controlling direct current. Direct current series and parallel systems. Feeders and mains. High tension D. C. systems. Timbie and Bush's Principles of Electricity. Two class hours. First semester.
Prerequisite: Physics 13, 14. Two units.

E. E. 102. Electrical Engineering. Self and mutual inductance. Capacity. Impedance. Phase angle and power factor. Series and repulsion types. Synchronous motors. Induction motors, single and polyphase. Methods of starting. Speed control. Electric drive for cranes, elevators, presses, pumps, fans, mill-work, etc. Timbie and Higbie's Alternating Current Electricity. First Course. Three class hours. Second semester.
Prerequisite: Physics 12 and E. E. 101. Three units

E. E. 103. Alternating Current Machinery. Electric power systems. Translating, controlling and transmitting equipment. Constant potential and constant current transformers. Efficiency, regulation and protection. Polyphase systems of generation. Two phase and three phase and conversion from one system to another. Calculation of alternating current transmission lines. Regulation of voltage. Power factor of systems. Switch-boards. Apparatus used on Switch-boards. Location. Types. Pole lines. Cable and conduit systems. Timbie and Higbie's Alternating Current Electricity. First course. Three class hours. First semester.

Prerequisite: E. E. 102. Three units.

E. E. 104. Alternating Current Machinery. Continuation of E. E. 103. Timbie and Higbie's Alternating Current Electricity, Second Course. Lawrence's Alternating Current Machinery. Three class hours. Second semester. Three units.

E. E. 105. Telephony. The magneto-telephone The microphone. Carbon transmitters. Induction coils. Call methods. Series and parallel circuits. Subscribers' equipment. Line disturbances. Common battery systems. Exchange equipment. Party lines. Automatic systems. Combined telegraphy and telephony. Wireless telegraphy. Generation of electrical waves. Transmitting and receiving apparatus. Electrical Engineer's Handbook. One class hour. First semester.

Prerequisite: Physics 12 and E. E. 101. One unit.

E. E. 106. Design of Direct Current Machinery. Electrical and mechanical theory applied to the design of D. C. machinery. Switches, heaters, controllers, etc. Complete calculations and working drawings for a dynamo or motor, to fulfill given specifications. Still's Electric Machinery Design. Four hours Drawing. First semester.

Prerequisite: E. E. 101. Two units.

E. E. 107. Power Plant Design. Design of a complete plant to furnish light and power for a city of given size. Consideration of the elements: illumination, charges, operating expenses, income, organization and administration, reports, specifications, contracts and statistics. Weingreen's Electric Power Plant Engineering. Two hours Lecture, four hours Drawing. Second semester.

Prerequisite: E. E. 103-106. Four units.

E. E. 108. Electrical Design. Design of alternators, transformers, induction motors and other alternating current apparatus. Thorough investigation and complete design of some unit assigned. Still's Electric Machinery Design. Four hours Drawing. Second semester. Two units.

E. E. 109. Electrical Engineering Laboratory. Determination of the resistance of electrical circuits. Relation between speed, field strength and voltage. Operation of shunt series and compound-wound generators. Distribution of potential around commutator. Heat runs to determine load capacity. Stray power. Starting boxes. Counter electro-motive force. Shunt, series, compound and differentially wound motors. Operation of shunt and compound wound generators in parallel. Distribution of load. Control of series circuits. Regulation of arc lamps. Constant potential and constant current generators. Karapetoff's Experimental Electrical Engineering. Four Hours Laboratory. First semester.

Prerequisite: Must be taking E. E. 101. Two units.

E. E. 110. Electrical Engineering Laboratory. Calibration of ammeters and voltmeters. Calibration and adjustments of A. C. and D. C. watt-hour meters. Determination of resistances. Measurement of inductance and capacity. Permeability of samples of iron and steel. Determination of hysteresis. Storage Batteries. Testing. Candlepower of lamps from standard candle. Cable testing. Insulation resistance. Practice in operation of A. C. motors, generators and other apparatus. Four hours Laboratory. Second semester.

Two units.

E. E. 111. Electrical Engineering Laboratory. Alternating current circuits. Inductance, capacity, impedance, phase, relation, true and apparent watts and power factor. Alternators. Magnetization curves. Losses of synchronous impedance. Synchronous motors. Methods of Synchronizing. Methods of starting rotary converters. Compounding. Calculation of efficiency. Alternators in parallel. Transformers. Regulation. Heating and Efficiency. Use as induction regulators and phase changers. Wave shapes by instantaneous contact and by the oscillograph. Resonance. Methods of starting induction motors. Efficiency by brake tests. Operation of induction generator. Reports of complete tests on plants. Four hours laboratory. First semester. Two units.

E. E. 112. Electrical Engineering Laboratory. Continuation of E. E. 111. Two hours Laboratory. Second semester.

Prerequisite: E. E. 111. One unit.

E. E. 114. Electricity. A short course similar to E E. 101 and E. E. 109 for Civil Engineering Students. Gray's Electrical Engineering. Two hours Lecture, two hours Laboratory. Second semester.

Three units.

E. E. 115. Electric Power Transmission. Electric principles and theory. Economic principles and calculations. Insulation of overhead lines. Transient phenomena. Underground lines. Mechanical design of transmission lines. Still's Electrical Transmission. Two class hours. Second semester. Two units.

E. E. 116. Radio. Fundamental Ideas and Laws. Resistance, Inductance and Capacity. Laws of Oscillating currents. Spark Telegraphy. Vacuum Tubes and their operation on typical circuits. Continuous-wave telegraphy. Radio Telephony. Wavemeters and their use. Morecraft's Principles of Radio Communication. Two class hours. One semester. Two units.

E. E. 170. Thesis and Seminar. Original investigation of some Engineering problem.

ECONOMICS

Courses for Advanced Undergraduates and Graduates

111. Economics. Object. Production, distribution, circulation and consumption of wealth. Production of wealth. Earth and natural agents. Labor and industry. Capital. Distribution of wealth. Individual property. Share of laborers. Circulation of wealth. Exchange. Taxes. Applications. This course is designed to give the student a broader view of his standing as a professional man in the community. One class hour. Second semester. One unit.

For additional courses in Economics, Sociology, Political Science, and Business Administration see the Bulletins of the Colleges of Liberal Arts and Business Administration.

ENGLISH

11. Composition and Rhetoric. Lectures and recitations. The invention, arrangement and presentation of material. The different species of historical, philosophical, scientific, critical, etc., masterpieces. Three class hours. First semester. Three units.

12. Composition and Rhetoric. Continuation of Eng. 11. Three class hours. Second semester.

Prerequisite: Eng. 11. Three units.

13. Rhetoric and Literature. A course in English Rhetoric and Literature. Students who show any deficiency in English are required to take, in addition, the course in Special Composition. One hour a week is devoted to the study of Engineering Literature. Three class hours. First semester. Three units.

14. Rhetoric and Literature. Continuation of 13. Three class hours.

Prerequisite: Eng. 13. Three units.

PUBLIC SPEAKING

11. Fundamentals of Expression. A short course in expression intended primarily for students in the College of Engineering. Fundamentals of expression; the speaking voice; expressive movement; impersonation; interpretation. Each student must report on memorized work at each class. One hour. First semester. One unit.

GENERAL ENGINEERING

Courses for Undergraduates

G. E. 1. Mechanical Drawing. Freehand lettering. Use of instruments. Plane problems. Freehand sketching. Orthographic, isometric and cabinet projections. Tracing and blue printing. French's Engineering Drawing. Six hours Drawing. First semester. Three units.

G. E. 2. Descriptive Geometry. Orthographic projection of points, lines, planes, warped surfaces, etc., in the four angles of projection. Intersections. Tangents to curves and surfaces. Developments. Practical problems in stereotomy, surveying, architecture, belting, layouts, etc. Cutter's Practical Descriptive Geometry. One hour Lecture, four hours Drawing. Second semester.

Prerequisite: G. E. 1. Three units

G. E. 7. Technical Mechanics. General theories and principles concerning matter, inertia, space and time, motion, velocity and acceleration. Momentum. Force. Measures. Comparison and representation of force. Static: Composition and resolution of concurring forces. Conditions of equilibrium. Composition and resolution of forecasting on a rigid body. Center of gravity. Friction. Virtual velocities. Machines. Funicular polygon. Attractions. Rectilinear and curvilinear motion. Kinetics. Laws of motion. Motion under the action of a variable force, and a resisting medium. Central forces. Constrained motion. Impact. Work and energy. Moments of inertia. Rotary motion. Motion of a system of rigid boilers in space.

Effort is made throughout the course to direct the attention of the student to practical application of mathematical deducions. This course must accompany Physics 11-14. Poorman's Applied Mechanics. Four class hours. First semester.

Prerequisite: Math. 13. Four units.

G. E. 8. Technical Mechanics. Continuation of G E. 7. Text as in G. E. 7. Four class hours. Second semester.

Prerequisite: G. E. 7. Four units.

G. E. 9. Review of Engineering Industries. Lectures and assigned reading on Engineering studies and work. This course is designed to teach the student how to study and to enable him to make a rational choice of a course of study. One class hour. First semester. One unit.

G. E. 9a. Review of Engineering Industries. Continuation of G. E. 9. One class hour. Second semester. One unit.

Courses for Advanced Undergraduates and Graduates

G. E. 109. Mechanics of Materials. Resistance and elasticity of materials. Pipes, cylinders and riveted joints. Simple and cantilever beams. Restrained and continuous beams. Columns, shafts and girders and their design. Torsion in shafts. Combined stresses. Strength and resilience of materials. Tension and compression. Flexure of beams. Shear and torsion. Apparent and true stresses. Plates, spheres and columns. Analytical and graphical methods used in the solution of problems. Seeley's Resistance of Materials. Four class hours. First semester.

Prerequisite: Math. 5 and G. E. 8. Four units.

G. E. 110. Materials Testing Laboratory. Tests of iron, steel, wood and concrete in tension, compression, shear, bending and torsion. Rattler tests on brick, and standard tests on road materials. Text: Hatt & Schofield's Laboratory Manual of Testing Materials. Two hours Laboratory. First semester.

Prerequisite: Must be taking G. E. 109. One unit.

G. E. 121. Hydraulics. Fundamental data. Hydrostatics. Theoretical hydraulics. Instruments and observations, especially meters and pressure gauges. Flow through orifices. Flow over weirs. Flow through tubes and pipes. Flow in conduits. Flow in rivers. Water-supply and water power. Dynamic pressure of water. Water wheels. Overshot, breast, undershot, vertical impulse, horizontal impulse and downward flow impulse wheels. Special forms of wheels. Turbines. Classification. Theory and design of turbines. Downward-flow and impulse turbines. Special devices. Naval hydro-mechanics. Pumps and pumping. Force and centrifugal pumps. Pumping engines. Other kinds of pumps. Pumping through pipes, and through hose. Hydraulic motors. Hydraulic-electric analogies. Stress is laid upon the effect of hydraulic laws upon engineering construction or under water, especially in problems involving the impounding of water or oil. Daugherty's Hydraulics. Three hours Lecture, two hours Laboratory. Second semester. Four units.

G. E. 127. Seminar. Reading and reports from current Engineering literature. One class hour. Second semester. One unit.

G. E. 131. Estimates and Specifications. Principally a lecture course, but supplemented by practical problems for which estimates and specifications must be submitted. Position of engineer in construction. Duties. Estimates. Corrections. Latitude allowed. Contracts. General kinds. Special. Specifications. Definiteness. Lectures on laws of contracts. Kirby's Elements of Specification Writing. Two class hours. Second semester. Two units.

GEODESY

126. Geodesy and Astronomy. Class, field and observatory work. Methods of field work to obtain accurate results. Construction, use and correction of errors in instruments. Observatory determination of latitude, longitude, azimuth and time. Field work in determining parallels and meridians. Latitude and azimuth. Transit, altazimuth and sextant, and their use. Solar transit. Triangulations and adjustments. Compass variations. Especial attention is directed to the use and correction of engineering instruments and their adaptability to astronomical use. Crandall's Text Book on Geodesy and Least Squares. Two hours Laboratory. First semester. One unit.

GEOLOGY AND MINERALOGY

Geology 33. A course in dynamical, structural and historical Geology. Particular attention is paid to structural Geology and the influences of Constructive and Engineering conditions. The student is made familiar with different stones by illustrating each recitation with specimens of the particular rocks treated, as well as their adaptability in construction, method of occurrence, etc. Ries and Watson's Engineering Geology. Three class hours. First semester. Three units.

Geology 34. Mineralogy. A course in Mineralogy with access to a large collection of specimens. Determination of unlabeled specimens. Crystallography. Blowpipe analysis. Includes a short course in Metallurgy. Iron ores and production of iron and steel. Percentage and effects of sulphur, silicon manganese and carbon in iron and steel. Coals, coke, carbons and ash. Text as in 1. Three class hours. Second semester.

Prerequisite: Geology 1. Three units.

HISTORY

For courses in History see Bulletin of the College of Liberal Arts, Department of History.

LAW

111. Business Law. A brief course in Contracts, Sales, Negotiable Instruments, Real Estate, Partnership, Corporations and such other subjects as may be selected. Allen's Business Law for Engineers. One class hour. Second semester. One unit.

For additional courses in Law see Bulletins of the Colleges of Liberal Arts and Business Administration, and of the Institute of Law.

MATHEMATICS

Courses for Undergraduates

11. Algebra. Complete Algebra to include quadratic equations; then more particularly: ratio and proportion, progressions, imaginary and complex numbers, indeterminate equations, binomial theorem, variables and limits, inequalities, interpretation of results, logarithms, permutations and combinations, undetermined coefficients, determinants and graphic algebra. Brenke's Advanced Algebra and Trigonometry. Three class hours. First semester. Three units.

12. Trigonometry. Development of general formulae. Functions and their relations. Logarithms and their uses. Properties of triangles. Application of principles to practical problems in right and oblique triangles. Navigation in plane trigonometrical problems. Spherical trigonometry. Application to problems in astronomy and spherical mensuration. Brenke's Advanced Algebra and Trigonometry. Two class hours. First semester. Two units.

13. Analytic Geometry. Loci. Lines. Circle. Different systems of co-ordinates. Conic sections. Supplementary proportions. Loci of second order. Plane curves of higher order. Solid analytical geometry, especially of revolution. General equations. Riggs' Analytic Geometry. Five class hours. Second semester.

Prerequisite: Math. 11 and 12. Five units.

14. Calculus. Fundamental formulae and principles for differential and integral calculus. Maxima and minima. Curvature. Surfaces. Volumes. Intermediate forms. Envelopes. Series Expansion. Forms of integration. Practical application. Townsend and Goodenough's Calculus. Five class hours. First semester.

Prerequisite: Math. 13. Five units.

15 Calculus. Continuation of 14. Five class hours. Second semester.

Prerequisite: Math. 14 Five units.

Courses for Advanced Undergraduates and Graduates

116. Differential Equations. Analysis and deduction of formulae and equations used in physics, mechanics and engineering problems. Applications of formulae and equations given in engineering handbooks to problems. Practical problems and lectures. Campbell's Differential Equations. Two class hours. Second semester.

Prerequisite: Math. 15. Two units.

117. Method of Least Squares. Study of the principles and methods. Application to problems. Merriman's Method of Least Squares. Two class hours. Second semester. Two units.

MECHANICAL ENGINEERING

Courses for Undergraduates

M. E. 3. Kinematics. Motion, velocity and acceleration of machine parts. Rolling cylinders and cones. Lobed wheels. Belts. Levers, Cams, Linkwork. Gearing. Parallel and straight line motion. Intermittent linkwork. Aggregate combinations. Keown's Mechanism and James and Dole's Mechanism of the Steam Engine. Two class hours. First semester.

Prerequisite: G. E. 1. Two units.

M. E. 4. Machine Drawing. Language of Mechanical Drawing. Conventional method of representing bolts, screws and other standards. Piping. Designing and detailing simple parts to take tension, compression and shear. Study of different methods of drawing and dimensioning found on commercial working drawings. Accuracy, completeness and speed are required. French's Engineering drawing. One hour Lecture, four hours Drawing. Second semester.

Prerequisite: M. E. 3. Three units.

M. E. 10. Shopwork. Woodworking. Shop clerical work and time study. Proper use and care of bench tools. Exercises in planing, squaring and simple joinery. Layout of all work from blueprints.

Woodturning. Operation and care of turning lathe and tools. Exercises in woodturning and finishing. Two hours Laboratory. First semester. One unit.

M. E. 11. Shopwork. (a) Forging. Management of the forge fire. Exercises in Drawing, Upsetting, Shaping, Swaging and welding. Hardening and tempering. Forging characteristics of different grades of iron and steel. Harcourt's Forge Practice.

(b) Patternmaking. Operation and care of power wood working machinery. Theory of patternmaking and moulding. Construction of simple wood patterns and core boxes. All work laid out from blue-prints. Two hours Laboratory. Second semester. One unit.

M. E. 12. Shopwork. Foundry practice. Floor and bench moulding. Casting of brass, bronze and alloys. Dry and green sand core work. Core making. Shop visits. Tate & Stone's Foundry Practice. Two hours Laboratory. First semester.

Prerequisite: M. E. 11. One unit.

M. E. 13. Shopwork. (a) Patternmaking. Continuation of M. E. 11.

(b) Advanced practice in all types of woodpatterns and core boxes. All layouts from working drawings.

(c) Machine shop practice. Operation and care of metal working machinery. Machining, drilling, chipping and filing. Calipering, gauging and fitting. Assembling and rigging. Shop visits. Two hours Laboratory. Second semester. One unit.

M. E. 15. Mechanical Engineering Laboratory. Method of investigation. Classification of errors. Accuracy of numerical calculations. Autographic diagrams. Calibration of pressure gauges, thermometers, pyrometers, indicator springs, tachometers, planimeters, weirs, nozzles, orifices, pitot tubes, Venturi meters and dynamometers. Testing of lubricants. Density, viscosity, gumming, fire test and cold test. Measurement of power by the prony brake, Alden brake, traction dynamometers and transmission dynamometers. meters, nozzles, pitot tubes, etc. Moisture in steam by barrel Hoadley, Barrus, throttling, separating and chemical calorimeters. Heating value of coals determined by the bomb calorimeter. Heating value of gas by Junker's calorimeter. Flue gas analysis with Orsat's apparatus. Complete tests of steam engines, boilers, gas engines, injectors, pumps and entire plants. Standard reports. Carpenter and Diedrick's Experimental Engineering. Four hours Laboratory. First semester.

Prerequisite: M. E. 11 and 12. Two units.

Courses for Advanced Undergraduates and Graduates

M. E. 105. Machine Design. Selection of materials for machine parts. Proper working stress for different materials under dead, repeated and reversed loads. Determination of nature and distribution of stresses in each element of a machine. Friction. Design of such elements as crank shafts, machine frames, connecting rods, etc., when subject to tension, compression, shear, torsion, bending or any combination of these. Figuring weight and cost of manufacture. The kinematic layout of a machine for functional operation. The evolution of a design from preliminary sketch to complete working and assembly of drawings, involving a study of strength, adaptability, symmetry, ease of operation, depreciation and cost of manufacture. In all this work the note-book is as important as the drawings. Albert's Machine Design. Four hours Drawing. First semester.
Belt testing. Measurement of flow of liquids and gases by means of

Prerequisite: M. E. 4. Two units.

M. E. 106. Machine Design. Continuation of M. E. 105. One hour Lecture, four hours Drawing. Second semester.

Prerequisite: M. E. 105. Three units.

M. E. 107. Machine Design. Continuation of M. E. 106. Four hours Drawing. First semester.

Prerequisite: M E. 106. Two units.

M. E. 108. Power Plant Design. Sites. Comparison of high-speed engines. Corliss engines, steam turbines and gas engines. Cost and adaptability of different types of steam boilers. Condensers. Economizers. Superheaters. Pumps. Stokers. Piping. Complete layout of a plant with specifications and advertisements for bids. Fernald and Orrok's Power Plants. Two class hours, four hours Drawing. First semester. Four units.

M. E. 114. Shopwork. (a) Machine shop practice. Continuation of (b) M. E. 13.

(b) Shop management. In this course the student is given certain tasks and shopwork assignments to carry out and oversee. The system involves Managing, Planning, Routing, Stock and Tool Room methods, Production and Time Records, and actual supervising and handling of lower classmen. Shop visits. Lectures. Two hours Laboratory. First semester.

Prerequisite: M. E. 13. One unit.

M. E. 114a. Shopwork. Continuation of M. E. 114. Two hours Laboratory. Second semester. One unit.

M. E. 116. Mechanical Engineering Laboratory. Continuation of M. E. 15. Two hours Laboratory. Second semester.

Prerequisite: M E. 15. One unit.

M. E. 117. Mechanical Engineering Laboratory. Continuation of M. E. 116. Four hours Laboratory. First semester.

Prerequisite: M E. 116. Two units.

M. E. 118. Boilers. Heat: conduction, convection and radiation. Heat of evaporation. Combustion. Smoke. Quantity of air required. Methods of firing. Classification of coals. Efficiency of combustion. Boiler horse-power. Types of boilers. Furnaces. Stokers. Draft. Boiler scale. Water purification. Explosions. Testing. Care of boilers. Gebhardt's Steam Power Plant Engineering. Two class hours. First semester.

Prerequisite: Physics 13, 14. Two units.

M. E. 119. Steam and Gas Machinery. Properties of steam. Slide-valve. Indicator. Simple and compound engines. High speed, Corliss and marine engines. Turbines. Steam pumps. Locomotives. Valve gears. Governors. Flywheels. Balancing. Steam engine performance. Operation of two and four cycle gas and oil Engines. Indicator analysis. Gebhardt's Steam Power Plant Engineering. Three class hours. Second semester.

Prerequisite: M. E. 118. Three units.

M. E. 120. Thermodynamics. Mechanical theory of heat. First and second laws of thermodynamics. Perfect gases. Saturated va-

pors. Superheated vapors. Hot air engine. Internal combustion engine cycles. Influence of engine cylinder walls. Friction of engines. Refrigerating machines. Injectors. Steam turbines. Ennis' Applied Thermodynamics. Three class hours. First semester.

Prerequisite: M. E. 119. Three units.

M. E. 121. Internal Combustion Engines and Automobiles. The theory and design of gas, gasoline and oil engines, gas producer practice; the combustion of gaseous fuels. Streeter's Internal Combustion Engines. Two class hours. First semester.

Prerequisite: M. E. 120. Two units.

M. E. 122. Hydraulic Motors. Action of water on curved vanes. Forces developed and effect of impact. Work done. Centrifugal action. Reaction turbines. Vane form and arrangement. Axial, radial and mixed flow wheels. Losses due to friction, shock, leakage and residual velocity. Impulse turbines. Experiments with turbines of various types. Governors. Centrifugal pumps. Theory. Radial and curved vanes. Velocity of flow. Volute. Diffuser. Guide vanes in diffuser. Impeller passages. Balancing. Losses. Efficiency. Selection and arrangement of water-wheels. Governors and auxiliary apparatus. Relation between available water supply, possible output and perfection of development work. Draft tubes. Stop valves. Gates. Vacuum and pressure relief standpipes. Analysis of typical installations. Water power costs. Daugherty's Hydraulic turbines. Two class hours. Second semester.

Prerequisite: G. E. 121. Two units.

M. E. 123. Industrial Engineering. The economic element in shop processes. Conditions for most economic production. Functional operation of machine tools. Limits of economic production. Machines for performing specific operations. Time study. Labor saving devices in the shop. Distribution of cost of machine production between different processes, power, labor and material. Fixed charges. Layout of shops for most direct production. Layout of system of management and cost determining system. Diemer's Factory Organization and Administration. Two class hours. First semester.

Prerequisite: M. E. 13. Two units.

M. E. 124. Industrial Engineering... Continuation of M. E. 123. Galbreith's Time Study. Three class hours Second semester.

Prerequisite: M. E. 123. Three units.

M. E. 125. Heating and Ventilation. Theory and design of the various systems for heating and ventilating buildings, including Hot Air, Hot Water, Steam and the plenum and vacuum systems and central station heating. Hoffman's Handbook for Heating and Ventilating Engineers. Two class hours. First semester. Two units.

M. E. 126. Heating and Ventilation. Continuation of M. E. 125. Two class hours. Second semester.

Prerequisite: M. E. 125. Two units.

M. E. 170. Thesis and Seminar. Original investigation of some Engineering problem.

MODERN LANGUAGES

For courses in Modern Languages see Bulletin of the College of Liberal Arts, Department of Modern Language.

PHILOSOPHY

Courses for Advanced Undergraduates and Graduates

111. Logic. The reasoning faculties and processes. Laws of thought. Truth. Certitude. Doubt. False Systems. Three class hours. First semester. Three units.

112. Ontology, Psychology. Being, its origin, development, explanation. Life, its origin and kinds. Origin of Species. Darwinism. Huxley. Haeckel. The Soul, its origin and spirituality. Three class hours. Second semester. Three units.

113. Theodicy. God, His existence, nature and attributes. Creation. Providence. Miracles. Three class hours. First semester. Three units.

114. Ethics. Right and Wrong. Natural Law. Sanction of Law. False forms of Morality. Worship. Homicide. Suicide. Duelling. Society. Marriage. Divorce. Socialism. Theories of Government. Suffrage. Liberty of the press. Church and State. Three units.

For additional courses in Philosophy see the Bulletin of the College of Liberal Arts, Department of Philosophy.

PUBLIC SPEAKING

Described under courses in English.

RELIGION

Courses for Undergraduates

11. Essentials of Christian Doctrine. Various Creeds. The Apostle's Creed. Each Article of the Creed is studied in particular, attention being given to any subject bearing directly on these articles, as Sin, the Powers of the Church, Infallibility, etc. Two hours. First semester. One unit.

12. Essentials of Christian Doctrine. The Law of God. What is commanded or forbidden by the Decalogue is studied in detail. The Precepts of the Church, Grace, Prayer, and each of the Seven Sacraments together with collateral subjects. Two hours. Second semester. One unit.

13. Christianity a Revealed Religion. What Religion is. What Revelation is. Kinds of revelations. What revelation necessary to know truths above human knowledge. Man's attitude toward Revelation. Primitive, Patriarchal, Mosaic Revelation. The Divine origin of Pre-Christian Revelation. The Christian Revelation—its origin, evidences of the divinity of its origin. Two hours. First semester. One unit.

14. The Church. The Dispenser of the Christian Religion. Institution of the Church. End of the Church. Constitution of the Church. Marks of the Church. The teaching office of the Church. Sources of the Church's teaching. The Rule of Faith. Two hours. Second semester. One unit.

Courses for Advanced Undergraduates and Graduates

111. God, the Author and Restorer of Our Salvation. The existence, nature and attributes of God. The Divine Trinity. God, the creator of the universe. Various grades of creation. The spiritual and material world. Man. Relation of different orders of creation to one another. God, the Redeemer of fallen man. Decree and plan of redemption. The Redeemer—one person and two natures. The work of redemption. Two hours. First semester. One unit.

112. The Plan of Redemption as Realized in Individuals. Grace, actual, habitual or sanctifying. The Sacraments as a means of Grace. The Sacraments are studied in general—their matter and form; their efficacy and the dispositions requisite to receive them validly and with fruit. Then each Sacrament is studied in detail. The Church as a means of Salvation. The four last things. Two hours. Second semester. One unit.

113. Christian Morals in General. Law as the objective norm of human actions. Conscience as the subjective norm of human actions. The conditions of morality. Moral good and moral evil. Two hours. First semester. One unit.

114. Christian Morals in Particular. The Christian's duties toward God—Faith, Hope, Charity. Religion. Direct and indirect acts of worship. The Church as the controller of religious worship. Duties towards ourselves and our neighbor—general and particular. Works of Supererogation or Christian Perfection. Two hours. Second semester. One unit.

SCIENCE

CHEMISTRY

1. General Inorganic Chemistry. Review of elementary principles and properties of the more important elements with their compounds. Includes a systematic study of important theories. Two hours Lecture. First semester. Two units.

2. General Inorganic Laboratory. Laboratory course to accompany Chemistry 1. Four hours laboratory. First semester. Two units.

3. General Inorganic Chemistry. An elementary course in the fundamentals continuing Chemistry 1. Two hours Lecture. Second semester.

Prerequisite: Chemistry 1, 2. Two units.

4. General Inorganic Chemistry Laboratory. A laboratory course to accompany Chemistry 3. Four hours laboratory. Second semester.

Prerequisite: Chemistry 1, 2. Two units.

13. Qualitative Analysis. A study of the principles of Analytical Chemistry. This course includes the descriptive chemistry of the metals. Two hours Lecture. One semester.

Prerequisite: Chemistry 3, 4. Two units.

14. Qualitative Analysis Laboratory. Dry and wet Analysis. Fundamental work in preparation for Quantitative Analysis. Four hours Laboratory. One semester.

Prerequisite: Chemistry 3, 4. Two units.

21. Organic Chemistry. A study of the compounds of carbon and their derivatives. The properties of the more important compounds are discussed; special attention is given to the alphatic series. Two hours Lecture. Two semesters.

Prerequisite: Chemistry 13, 14. Four units.

22. Organic Chemistry Laboratory. Laboratory course accompanying Chemistry 21. The typical cyclic and acyclic compounds are prepared and their properties investigated. Four hours Laboratory. Two semesters.

Prerequisite: Chemistry 13, 14. Four units.

Courses for Advanced Undergraduates

101-102. Quantitative Analysis. Gravimetric and volumetric analysis. The work is regarded as preliminary training for more advanced work. Special attention is given to stoichimetrical relations and the application of the fundamental laws of chemistry to qualitative analysis. One hour lecture, six hours Laboratory. First semester.

Prerequisite: Chemistry 21, 22. Four units.

103-104. Physical Chemistry. Lectures covering the field of physical chemistry, with special emphasis upon the applications to biology; laboratory work consists of exercises in the practice of physical-chemical measurements. Two hours lecture and four hours laboratory. One semester.

Prerequisite: Chemistry 101-102. Four units.

170. Seminar. First semester. Discussion of assigned topics in theoretical and applied chemistry.

Second semester. Principally thesis work.

Units and hours to be arranged.

Prerequisite: Chemistry 103-104.

PHYSICS

Courses for Undergraduates

1. Mechanics, Molecular Physics, Sound. General principles of matter. General properties of Bodies. Equilibrium. Gravity. Pendulum. Properties peculiar to Solids. Capillarity. Hydro-dynamics. The properties of gases. Aerodynamics. Two hours Lecture. Second semester. Carhart's College Physics. Two units.

11. Wave Motion, Sound, Light. Production, propagation and reflection of sound. The physical theory of music. Transmission, velocity and reflection of light. Mirrors. Lenses. Dispersion and achromatism. Optical instruments. The eye. Double refraction. Interference and polarization. Carhart's College Physics. Two hours Lecture. First semester. Two units.

12. Physical Laboratory. Laboratory course to accompany physics 11. Four hours Laboratory. First semester. Two units.

13. Heat, Magnetism, Electricity. Properties of magnetism. Laws of magnetic action. Terrestrial magnetism. Quantitative laws of electric action. Distribution. Electrostatic induction of influence. Electric machines. Condensation of electricity. Voltais cell. Its modifications. Magnetic field due to current. Galvanometers. Ohm's law. Conversion of electric energy into heat. Thermo-electricity. Electrodynamics. Electro-magnets. Magnetism of iron. Telegraphy. Electromagnetic induction. Passages of electricity through gases. Magneto and dynamo-electric machines. Diamagnetism. Connection between electricity and light. Carhart's College Physics. Two hours Lecture. Second semester.

Prerequisite: Physics 11, 12. Two units.

14. Physical Laboratory. Laboratory course to accompany Physics 13. Four hours Laboratory. Second semester.

Prerequisite: Physics 11, 12. Two units.

Courses for Advanced Undergraduates and Graduates

104. Electric Measurements. A laboratory course in Electrical Engineering. Two hours Laboratory. One semester.

Prerequisite: Physics 13, 14. One unit.

For additional work in Physics see Bulletin, College of Liberal Arts, Department of Physics.

COLLEGE OF LAW

FACULTY

CORNELIUS JOSEPH McCOY, S. J., A. M.
President of the University

WILLIAM CHARLES GIANERA, S. J., A. M.
Dean of the Faculties

CLARENCE C. COOLIDGE, B. S., A. B., J. D.
Dean of the College of Law
Equity, Conflict of Laws, Constitutional Law

JOSEPH MATTHEW GEORGEN, S. J., A. M.
Director of Discipline

JOHN PETER MOOTZ, S. J., A. M.
Dean of Men
Ethics

HUNTER S. ARMSTRONG, A. B., LL. B.
Property, Criminal Law & Procedure, Evidence, Partnerships

JOHN MAY BURNETT, A. B., LL. B.
Code Pleading, Torts

ALBERT MICHAEL CASEY, S. J., A. M.
Psychology

HARLAN H. DYKES, A. B., LL. B.
Elementary Law

EDWARD MARTIN FELLOWS
Domestic Relations, Common Law Pleading

ALLAN PETER LINDSAY, A. B.
Bailments & Carriers, Negotiable Instruments, Wills

PETER FRANCIS MORETTINI, A. B., LL. B.
Business Law, Court Practice

EDWARD PRESTON MURPHY, A. B., LL. B.
Business Law, Legal Biliography

EDWARD SHIPSEY, S. J., A. M.
Political Science

RONALD GRANT STEWART, A. B., J. D.
Agency, Damages

IVOR EDGAR WALLIS, LL. B.
Contracts and Sales

HENRY WOODS, S. J., Ph. D.
Librarian

COLLEGE OF LAW

INTRODUCTION

The purposes of the College of Law are:

To give a thorough training in the fundamental principles of English and American law, and the modifications thereof peculiar to the State of California;

To guide the student by actual practice in office work and court procedure to a proper application of the principles of law to concrete cases;

Finally, to imbue the student with the correct ethical principles that should govern the legal profession.

The method of instruction followed is the Case system—an exact discussion of the cases presented in the best manuals with a view to deriving the principles which have determined their decisions. This study of rules and principles is never lost sight of by the Professor and is rigidly exacted from the student in all examinations.

Lectures on particular phases of the law are given from time to time by the Faculty and by occasional lecturers.

Thorough courses in Philosophy and Political Science, covering a period of two years, are offered by the University in the College of Liberal Arts.

All law students who are candidates for the Degree of Bachelor of Arts or its equivalent are required to follow these courses.

Other law students are urged to do so but not obliged.

The Faculty strongly recommend all students to take advantage of these courses because they are of great value in developing the reasoning faculties and in grounding the student in sound principles of ethical conduct—two things absolutely necessary to the soundest and highest success in the legal profession.

The College of Law maintains a system of practice courts which is modeled essentially on the California system of courts of record, and is presided over by a member of the Faculty.

The court holds weekly sessions at which business is transacted in the manner usual before state courts, with the constant instruction, advice and correction of the presiding judge. On given statements of fact, student counsel issue, serve and return regular processes, prepare and file the proper pleadings according to the California Code practice, argue demurrers, impanel juries, examine witnesses, and in brief, carry their cases through from summons to final judgment.

No student in the College of Law is allowed to take the State Examination for admission to the Bar before he has completed successfully the course of study prescribed by the University for the

LL. B. degree or the Certificate in Law, and until such successful completion of the course has been certified to by the Dean of the College of Law and by the Dean of the Faculties. Immediate exclusion from the College of Law will follow any violation of this regulation.

ENTRANCE REQUIREMENTS

The College of Law is open to the following classes of students:

1. Those who have the degree of Bachelor of Arts, Bachelor of Science, or their equivalent, from this or some other college or university.

2. Those who have completed the first two years of college work either at this University or at some other college or university offering satisfactory courses leading to academic degrees. Students of this class may complete their college work by following the Junior and Senior courses in Philosophy in the College of Arts and Sciences, and thus receive the degree of Bachelor of Arts or Philosophy or Science at the end of their second year in the College of Law, and the degree of Juris Doctor or Bachelor of Laws (according to their qualifications) at the end of the fourth.

Students of the first and second classes are **regular students.**

3. Graduates of approved high schools with credits of recommended grade whose experience in business or whose private study has made up for their lack of collegiate training and whose maturity and seriousness fit them, in the discretion of the Faculty, for the study of law. Such are, for example, young men employed in insurance and real estate offices, banks, railroad offices and law firms, as well as those who have studied privately and so acquired knowledge for which, because of its variety and mode of acquisition, educational institutions are unable, as a rule, to give credit. These are **special students.** The number to be admitted each year is limited by the ruling of the Association of American Law Schools.

Advanced Standing. Any person who has been in regular attendance for at least one academic year at another law school, having similar admission requirements, may in the discretion of the Faculty of the College of Law, and on such terms, with or without examination, as it may prescribe, receive credit for the work done at such other law school not exceeding in any case three years. The last year must be spent in residence in the College of Law. Such transfer students must present a transcript of record showing an average of 80 per cent or better in their previous legal studies. Otherwise they will be placed on probation during the first semester of attendance.

REQUIREMENTS FOR GRADUATION

In order to graduate or receive the certificate, the student must have completed the regular course of four years of the College of Law. This implies:

1. Credit for at least sixty units (a unit is the equivalent of one hour a week for one semester). No one is allowed a unit in any course at which he has not been present ninety per cent of the class hours, and in which his average is not at least passing (seventy-five per cent).

2. Fulfillment of the requirement of residence in a standard law school, the last year of which must be spent in this College of Law.

3. The submission of a satisfactory thesis on some legal question selected by the student and approved by the Faculty.

The thesis must contain not less than five thousand words.

It must represent original work and thought, and consist of a thorough discussion of the cases bearing upon the subject, and must not be a mere series of extracts from cases or treatises, loosely strung together. Pertinent authorities must be cited by giving the volume and page, and also the particular case referred to. In addition to the ordinary citation, the writer should also give the place where the same case may be found in the selected case series and the Reporter system. It must be in typewriting on paper 8½x11 inches in size.

The submission of an acceptable thesis is an absolute prerequisite to admission to final examinations.

4. In addition to the above requirements, candidates for the Juris Doctor degree must pass all required tests in Roman Law, International Law, and the History of English Law.

Having thus qualified for graduation, the student will be given either the Degree of Juris Doctor (J. D.), the Degree of Bachelor of Laws (LL. B.), or a certificate stating that he has satisfactorily completed the course in legal subjects given in the College of Law.

The Degree of Juris Doctor will be conferred upon the following classes of students providing they have complied with Section 4 of the conditions of graduation:

1. Those who entered with the degree of A. B. or B. S., or their equivalent, from this University or another college or university of recognized standing.

2. Those who, having entered with credit for the first two years of college work, have completed the course in Philosophy and Political Science along with their legal studies and have received the degree of A. B. or its equivalent from this University.

The Degree of **Bachelor of Laws** will be conferred upon the following classes of students:

1. Those possessing other academic degrees as just explained, who have not complied with Section 4 of the conditions of graduation.

2. Those who, having entered after the completion of the first two years of college work, have confined themselves to law, and have maintained throughout their course an average of eighty-five per cent in each subject separately.

3. Those who, having entered after the completion of the first two years of college work, have done satisfactory work in some subjects included in the courses of Philosophy and Political Science, such work being insufficient to warrant conferring on them the degree of A. B. or its equivalent, and who have, in addition, maintained throughout their course an average of eighty-five per cent in every legal subject. Where a student has done such work, but, while reaching a passing mark, has fallen below said average of eighty-five per cent in every legal subject, he may nevertheless be awarded the degree of Bachelor of Laws by special action of the Faculty, the degree of allowance made him being proportioned to the number of hours' work satisfactorily done in Philosophy and Political Science.

The **Certificate** will be conferred upon the following classes of students:

1. Special students who have throughout their course maintained an average of eighty-five per cent in every legal subject.

2. Special students who in addition to their work in law have done satisfactory work in the courses in Philosophy and Political Science or some subjects included therein, and who have also maintained an average of eighty-five per cent in every legal subject. Where a student has done such work, but while reaching a passing mark has fallen below said average of eighty-five per cent in every legal subject, he may nevertheless be awarded the certificate, by special action of the Faculty, the degree of allowance made him being proportioned to the number of hours' work satisfactorily done in Philosophy and Political Science.

PRIZES

The American Law Book Company Prize. A set of law books awarded to the student in the course of Legal Research having the highest average.

The Bancroft-Whitney Company Prize. A set of law books awarded to the member of the Senior year having the highest average.

DESCRIPTION OF COURSES

Courses for Undergraduates

1, 2. Elementary Law. This is an elementary course primarily for undergraduates in the Prelegal course of the College of Liberal Arts, and is a prerequisite for all advanced courses in the College of Law. Robinson's Elementary Law. Three hours.

Prerequisite: Sophomore standing. Six units.

For full description of Prelegal course see Bulletin of College of Liberal Arts.

Courses for Advanced Undergraduates and Graduates

First and Second Years

The completion of the courses in Elementary Law and at least two years of College work is a prerequisite for all the advanced Law courses.

101. Agency. Huffcut's Cases. Second semester. Two units.

102. Bailments and Carriers. Goddard's Cases. First semester. One unit.

103. Code Pleading. Sunderland's Cases, supplemented by syllabus of Professor. Second semester. Two units.

104. Common Law Pleading. Sunderland's Cases. First semester. Two units.

105a. Contracts. Huffcut's & Woodruff's Cases in Contracts. First Semester. Three units.

105b. Contracts-Sales. Huffcut & Woodruff's Cases in Contracts, supplemented by Burdick's Cases in Sales. A continuation of Course 105a. Second semester. Two units.

106. Criminal Law. Derby's Cases in Criminal Law. First semester. Two units.

107. Criminal Procedure. Derby's Cases in Criminal Law, supplemented by Fricke's Outline of California Criminal Procedure. A continuation of Course 106. Second semester. One unit.

108. Damages. Bauer's Cases. First semester. Two units.

109. Domestic Relations. Madden's Casts. Second semester. One unit.

110. Legal Research. "Law Books and their Use." Two semesters. Two units.

111. Negotiable Instruments. Britton's Cases. Second semester. Two units.

112. **Personal Property.** Warren's Cases. Second Semester. Three units.

113. **Real Property.** Finch's Cases. Two semesters. Four units.

114. **Torts.** Burdick's Cases. First Semester. Three units.

Third and Fourth Years

The completion of the first two years of the Law Course with a grade of 80 per cent or better is a prerequisite for the taking of the following courses.

201. **California Practice.** Lectures, Code of Civil Procedure of California, and Selected California Cases. First semester. Two units.

203. **Conflict of Laws.** Dwyer's Cases on International Law. First semester. Two units.

204. **Constitutional Law.** Evans' Constitutional Law. Second semester. Two units.

205. **Equity.** Throckmorton's Cases. First semester. Two units.

206. **Equity Pleading.** Second Semester One unit.

207. **Evidence.** Wigmore's Cases. Two semesters Four units.

208. **Insurance.** Woodruff's Cases. Second semester. Two units.

209. **Legal Ethics.** Jessup: Professional Ideals of the Lawyer. First semester. One unit.

210. **Mortgages.** Kirchwey's Cases. Second semester. One unit.

211. **Partnership.** Gilmore's Cases. First semester. One unit.

212. **Private Corporations.** Canfield and Wormser's Cases. Two semesters. Four units.

213. **Trusts.** Costigan's Cases. Second semester. Two units.

214. **Wills and Probate Law.** Costigan's Cases. First semester. Two units.

215. **Moot Court.** Practice Court. Both semesters for the III and IV years. One unit each semester.

Courses for Graduate Students

221. **Roman Law.** Synopsis, quiz and written examinations. Sohm's Institutes of Roman Law (Ledlie) 3rd Edition. Hours and credits to be arranged.

222. **International Law.** Synopsis, quiz and written examinations. Taylor's International Law, "Cyc," "International Law," "War." Hours and credits to be arranged.

223. **History of English Law.** Synopsis, quiz and written examinations. Pollock & Maitland. Hours and credits to be arranged.

PREMEDICAL DEPARTMENT

PRE-DENTAL DEPARTMENT

PREMEDICAL DEPARTMENT

INTRODUCTION

This course, extending over three years, is designed to comply with the requirements of the best medical schools in the United States, and to give the student a preliminary laboratory training which will familiarize him with future work.

The entrance requirements for this course are listed in the Requirements for Admission to the College of Liberal Arts and are the standard requirements of the American Medical Association.

The minimum requirements for the junior certificate for those who intend to pass to a standard medical college must include twelve units of chemistry, eight units of physics, eight units of biology, six units of English and twelve units of other non-science subjects. Students are strongly urged to take courses also in modern languages, philosophy, mathematics, additional chemistry, Latin, and history.

PRE-DENTAL DEPARTMENT

This course, extending over three years, follows in the main the schedule of courses of the three-year premedical program.

SCHEDULE OF COURSES

First Semester	Units	Second Semester	Units
Freshman			
English (Engl. 1)	3	English (Engl. 2)	3
Public Speaking (Pub. Spkg. 1)	1	Public Speaking (Pub. Spkg. 2)	1
Philosophy (Phil. 11)	3	Philosophy (Phil. 12)	3
Inorganic Chemistry (Ch. 1, 2)	4	Inorganic Chemistry (Ch. 3, 4)	4
Modern Language	3	Modern Language	3
General Zoology (Biol. 1)	3	General Zoology (Biol. 2)	3
Religion (Relig. 1)	1	Religion (Relig. 2)	1
Physical Education	½	Physical Education	½
Sophomore			
Philosophy (Phil. 13)	3	Philosophy (Phil. 14)	3
Trigonometry (Math. 12)	3	Physics (Phys. 1)	2
Modern Language	3	Modern Language	3
Embryology (Biol. 3)	4	Comparative Anatomy (Biol. 4)	4
Organic Chemistry (Ch. 21, 22)	4	Organic Chemistry (Ch. 21, 22)	4
Religion (Relig. 3)	1	Religion (Relig. 4)	1
Junior			
Psychology (Phil. 101)	3	Theodicy (Phil. 102)	3
Chemistry (Chem. 101, 102)	4	Chemistry (Chem. 103, 104)	4
Physics (Phys. 11, 12)	4	Physics (Phys. 13, 14)	4
Electives	6	Electives	6
Religion (Relig. 101)	1	Religion (Relig. 102)	1

DESCRIPTION OF COURSES

BIOLOGY

1. General Zoology. An introductory course designd to lay a broad foundation of the general principles of biology as a part of a liberal education, as a preparation for the study of medicine, or for advanced work in science. Structure, life history, and physiology of typical animals are studied in the laboratory. Two hours Lecture, two hours Laboratory. First semester. Three units.

2. General Zoology. A continuation of Biology 1. Two hours Lecture, two hours Laboratory. Second semester. Three units.

3. Embryology. Cell division, spermatogenesis, ovogenesis, fertilization, cleavage, gastrulation and the origin of the germ layers of various vertebrates and invertebrates. The study of the development of the different systems. The laboratory work includes a study of chick embryo living specimens, 24-72 hours of incubation. A study of chick embryo whole mounts up to 72 hours. A study of serial, cross and sagittal sections of chick embryo up to 72 hours. Two hours Lecture, four hours Laboratory. First semester.
Prerequisite: Biology 1, 2. Four units.

4. Comparative Anatomy. Comparative studies of adult forms, their organs and organ systems. The laboratory work is devoted to the critical dissection of the cat and dogfish. Two hours Lecture, four hours Laboratory. Second semester.
Prerequisite: Biology 3. Four units.

CHEMISTRY

1. General Inorganic Chemistry. Review of elementary principles and properties of the more important elements with their compounds. Includes a systematic study of important theories. Two hours Lecture. First semester. Two units.

2. General Inorganic Laboratory. Laboratory course to accompany Chemistry 1. Four hours laboratory. First semester. Two units.

3. General Inorganic Chemistry. An elementary course in the fundamentals continuing Chemistry 1. Two hours Lecture. Second semester.
Prerequisite: Chemistry 1, 2. Two units.

4. General Inorganic Chemistry Laboratory. A laboratory course to accompany Chemistry 3. Four hours laboratory. Second semester.

Prerequisite: Chemistry 1, 2. Two units.

13. Qualitative Analysis. A study of the principles of Analytical Chemistry. This course includes the descriptive chemistry of the metals. Two hours Lecture. One semester.

Prerequisite: Chemistry 3, 4. Two units.

14. Qualitative Analysis Laboratory. Dry and wet Analysis. Fundamental work in preparation for Quantitative Analysis. Four hours Laboratory. One semester.

Prerequisite: Chemistry 3, 4. Two units.

21. Organic Chemistry. A study of the compounds of carbon and their derivatives. The properties of the more important compounds are discussed; special attention is given to the alphatic series. Two hours Lecture. Two semesters.

Prerequisite: Chemistry 13, 14. Four units.

22. Organic Chemistry Laboratory. Laboratory course accompanying Chemistry 21. The typical cyclic and acyclic compounds are prepared and their properties investigated. Four hours Laboratory. Two semesters.

Prerequisite: Chemistry 13, 14. Four units.

Courses for Advanced Undergraduates

101-102. Quantitative Analysis. Gravimetric and volumetric analysis. The work is regarded as preliminary training for more advanced work. Special attention is given to stoichimetrical relations and the application of the fundamental laws of chemistry to qualitative analysis. One hour lecture, six hours Laboratory. First semester.

Prerequisite: Chemistry 21, 22. Four units.

103-104. Physical Chemistry. Lectures covering the field of physical chemistry, with special emphasis upon the applications to biology; laboratory work consists of exercises in the practice of physical-chemical measurements. Two hours lecture and four hours laboratory. One semester.

Prerequisite: Chemistry 101-102. Four units.

PHYSICS

1. Mechanics, Molecular Physics, Sound. General principles of matter. General properties of Bodies. Equilibrium. Gravity. Pendulum. Properties peculiar to Solids. Capillarity. Hydro-dynamics. The properties of gases. Aerodynamics. Two hours Lecture. Second semester. Carhart's College Physics. Two units.

11. Wave Motion, Sound, Light. Production, propagation and reflection of sound. The physical theory of music. Transmission, velocity and reflection of light. Mirrors. Lenses. Dispersion and achromatism. Optical instruments. The eye. Double refraction. Interference and polarization. Carhart's College Physics. Two hours Lecture. First semester. Two units.

12. Physical Laboratory. Laboratory course to accompany physics 11. Four hours Laboratory. First semester. Two units.

13. Heat, Magnetism, Electricity. Properties of magnetism. Laws of magnetic action. Terrestrial magnetism. Quantitative laws of electric action. Distribution. Electrostatic induction of influence. Electric machines. Condensation of electricity. Voltais cell. Its modifications. Magnetic field due to current. Galvanometers. Ohm's law. Conversion of electric energy into heat. Thermo-electricity. Electrodynamics. Electro-magnets. Magnetism of iron. Telegraphy. Electromagnetic induction. Passages of electricity through gases. Magneto and dynamo-electric machines. Diamagnetism. Connection between electricity and light. Carhart's College Physics. Two hours Lecture. Second semester.

Prerequisite: Physics 11, 12. Two units.

14. Physical Laboratory. Laboratory course to accompany Physics 13. Four hours Laboratory. Second semester.

Prerequisite: Physics 11, 12. Two units.

ENGLISH, HISTORY, MATHEMATICS, MODERN LANGUAGES, RELIGION, PUBLIC SPEAKING, ADDITIONAL PHILOSOPHY AND SCIENCE

Courses are offered in these subjects in the College of Liberal Arts and are open to students in the Premedical Course. For detailed description of courses consult the Bulletin of the College of Liberal Arts.

THE OBSERVATORY

ASTRONOMICAL AND METEOROLOGICAL OBSERVATORIES THE SEISMOLOGICAL STATION.

Jerome Sixtus Ricard, S. J., A. M.
Director of Astronomical and Meteorological Observatories
James Bernard Henry, S. J., A. M.
Director of Seismological Station
Albert Joseph Newlin, B. S., LL.B., J. D.
Associate in Meteorology and Seismology

The Astronomical and Meteorological Observatories are under the immediate direction of Father Ricard, known throughout the country as the "Padre of the Rains". In recognition of the work of Father Ricard, the Knights of Columbus have built the Knights of Columbus Ricard Memorial Observatory, which provides the facilities and equipment for a much more comprehensive investigation of astronomical and meteorological problems, and a correspondingly greater service to the country.

Through its Seismological Station the University is a member of a chain of seismological stations maintained by the Jesuits throughout the world, and has been a pioneer on the Pacific Coast in the recording and observation of seismological disturbances, as well as in the study of their causes.

The University Seismological Station still operates two Wiechert seismographs, consisting of one vertical and two horizontal components. Recently, however, a new impetus has been given this branch of geophysical investigation by the construction of a vault embodying all that was found best and latest in stations of this type. The Seismological Station is now in possession of three new Galitzin Seismometers of the long-period type, which will be located in the new vault. Provision has also been made to accommodate the two horizontal components of the Wood-Anderson Seismometers which are now being constructed at Pasadena for this Station. The latter have been designed for a special study of local earthquakes and are the short-period type. Finally, the University hopes to complete this station by the installation of a "Shortt Synchronome Clock", thus assuring accurate time for all our records.

Of special prominence, however, is the work which has been done in long range weather forecasting through a study of sun spots. This line of study was instituted by Father Ricard over a generation ago and in the meantime he has built up a large mass of data in this regard, so that the records and observations at the University are perhaps the most complete of any in the country. Monthly forecasts are sent out regularly from the Observatory. With the aid of such new instruments as the 18.5 - inch reflector and the spectroheliograph, Father Ricard will be enabled to pursue his researches with greater facility and success.

JESUIT
JUNIOR COLLEGE
AND
SEMINARY
LOS GATOS, CALIFORNIA

JESUIT JUNIOR COLLEGE

Rev. Leo S. Simpson, S. J., A. M.
Dean
Professor of Education and Greek

Rev. Edward P. Kenney, S. J., A. M.
Vice-President

Rev. Daniel Bassett, S. J., A. M.
Professor of Eloquence, English and Latin

John Curran, S. J., A. M.
Professor of Eloquence, Greek and Latin

Rev. Peter M. Dunne, S. J., A. M.
Professor of English, History, Latin and History of Education

Rev. Dominic Giacobbi, S. J., A. M.
Chaplain

Rev. Thomas A. Meagher, S. J., A. M.
Professor of Asceticism and Religion

Rev. Francis Seeliger, S. J., A. M.
Professor of Greek and Latin

INTRODUCTORY STATEMENT

Sacred Heart Seminary, though under separate management and financially not connected with the University, is affiliated to it in its academic work, and all its courses are credited towards the obtaining of degrees. There are courses in Classics, English, Education, History and Public Speaking, open to members of the Jesuit order only. The minimum prerequisite of academic work is the completion of standard high school requiring four years of Latin. Frequently the students have one or more years of college work to their credit before being admitted to the school. The regular course of religious and academic training comprises four years, the first two of which are largely devoted to religious exercises for the purpose of moral training and of developing those qualities of heart and character that are so important in any teacher, but most of all in the religious teacher. Study and academic instruction are not neglected, both being chiefly directed towards securing a solid foundation for the advanced work of the third and fourth years. These two years are given wholly to scholastic work. Students who are unable to do the work assigned to the last two years in a satisfactory manner and within the prescribed time are required to add another year to their course before being allowed to proceed to higher studies.

DESCRIPTION OF COURSES

History of Education

1. Ancient Education. Course deals with the history of primitive and oriental education. It treats also the liberal education of the Greeks and the practical training of the Romans. One unit.

2. Early Christian and Mediaeval Education. The course studies the struggle of the Church to introduce civilization into Western Europe, the monastic schools which were opened, the development of Scholasticism, the founding of universities in various parts of Europe. One unit.

3. Modern Education. The earlier systems are considered. The Renaissance in Education. The Reformation and Education. Types of Religious Schools. The Jesuit System of Education. An historical and critical study of the Ratio Studiorum. One unit.

4. Modern Education. Course deals with more recent systems. The work of the great educational reformers. The development of national school systems in Europe and in the United States. One unit.

Educational Method

5. Teacher's Course in High School English. The rhetoric to be taught in high school, its method of presentation and its application to written composition. Graduation and development of written composition. Methods of correction, standards of valuation. The literature to be studied, the method for its presentation and study. Oral English. Two units.

English

1. Advanced Rhetoric. The theory of rhetoric, the study of style, and the requisites of the various species of writing. One unit.

2. Study of Poetry. The intellectual, imaginative and emotional elements of poetry. The technique of versification. One unit.

3. Oratory. Study of the oration, its sources of argument, its structure and delivery. One unit.

4. The Drama. The theory of the drama. Its history and development. The plot and its analysis. One unit.

5-6. History of American Literature. A survey course covering its chief influences and writers. Two units.

7-8. History of English Literature. An outline study of modern English literature. Two units.

9. **English Prose.** The essayists. One unit.

10. **English Poets.** Representative selections from the leading poets. One unit.

11. **The Orators.** A critical study of their speeches. One unit.

12. **Shakespeare.** Shakespeare's life, influence, sources of his drama; a study of his chief plays. One unit.

13. **Newman.** A study of his excellent prose. One unit.

14. **Public Speaking.** (a) The fundamentals of public speaking. Training in voice, in appreciative reading and in platform speaking. One unit.

(b) A study of the formal and informal speech; training in the lecture, address and familiar instruction. Debating. One unit.

Greek

A-B Elementary Course. Etymology and syntax. Greek Reader, Anabasis. Exercises based on Xenophon. Eight units.

1. Herodotus, Xenophon, Plutarch, Basil, Syntax. Four units.
2. Chrysostom, Lucian, Homer, Syntax. Four units.
3. Demosthenes: Philippics, Olynthiacs, The Crown. Four units.
4. Sophocles: Oedipus Tyrannus, Seven Against Thebes. Four units.
5. Plato: Defense of Socrates, Phaedro. Four units.
6. Selected Greek Lyrics. Two units.
7. Simple themes on rules of syntax (Arnold's Greek Prose). Two units.
8. Advanced themes. Two units.

Latin

Latin is taught and spoken as a living language.

1. Cicero: De Senectute, Oratorical Narrations, Pro Marcello, Pro Archia, Pro Lege Manilia. Four units.
2. Virgil: Eclogues, Georgics, Aeneid. Four units.
3. Livy. Two units.
4. Ovid: Metamorphoses, Elegies. Two units.

5. Horace: Odes, Epodes, Satires, Epistles. Four units.

6. Cicero: Pro Milone, In Catilinam, Pro Ligario. Two units.

7. Tacitus: Sallust. One unit.

8. Plautus: Captivi. Two units.

9. Latin Composition. (Arnold-Bradley's Latin Prose Composition.) Two units.

10. Latin Composition. (Bradley's Aid to Latin Prose.) Original Compositions. Latin Prosody. Two units.

History

1-2. **Ancient History.** Egypt; Assyria; the Pre-Hellenic Civilizations; Greece, Rome—their civilization and their influence; the Migrations of the Nations. Four units.

3-4. **Modern History.** Age of Charlemagne; Development of the Feudal System; the Crusades; the Papacy of the Middle Ages; the Hundred Years' War; the Renaissance; the Protestant Revolt; the Wars of Religion; the period of Louis XIV; French Revolution; Industrial Revolution and the Modern Democracies. Four units.

DEGREES CONFERRED

May 13, 1928

DOCTOR OF LAWS

Frederick C. Gerlach, M. S. '91, M. D.
John Steven McGroarty, Litt. D.
Hon. Joseph J. Trabucco, B. S. '90, LL. B.
Michael Williams, Litt. D.

JURIS DOCTOR

Adolph B. Canelo, Jr., A. B. '15, LL. B. '16

MECHANICAL ENGINEER

Joseph E. Becker, B. S. in M. E., '24
Leo M. Martin, B. S. in E. E., '19, B. S. in M. E., '20

BACHELOR OF LAWS

Henry W. Brown, Ph. B. '26
Edward P. Murphy, A. B. '27
Thomas J. Randazzo, Ph. B. '26

BACHELOR OF ARTS

Joseph J. Deacon
Victor L. Diepenbrock *
Thomas L. Keating
George A. Martinelli
Alvin J. Wolf **

BACHELOR OF SCIENCE

John L. Connolly
J. Raymond Deasy
Pasquale J. DiPaolo
R. Allan Early
Ian B. Hunter
John E. Hurley
Peter J. Mancuso
Kenneth P. Mahony
Leonard F. Reeg *
Paul J. Torelli

BACHELOR OF PHILOSOPHY

George W. Donohoe
Guido J. Granucci
Fenton J. McKenna
John A. Spann
Lovett W. Stanton

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

Roderick A. Chisholm, Jr.
John B. Kiely
Carl J. Leininger
John J. Leonard

* Cum laude.
** Magna cum laude.

DEGREES CONFERRED

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

Donald G. Birmingham
William I. Boland
Eldred J. Caveney
Nicholas K. Delaney *
Cyrus Henry LeBorgne
Ralph A. MacIntyre
C. Elmer Newton
Robert P. O'Brien **

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

Thomas I. King

BACHELOR OF COMMERCIAL SCIENCE

William W. Burke
Joseph W. McNealy
Harry B. Morey
Wayne H. O'Brien
Earle J. Reynolds

JUNIOR CERTIFICATES

Ramon Alcazar, Jr.
Edward W. Boland (with first honors)
Francis E. Burris
Ned Clark
Eugene E. Col
Fred D. Cottle
John H. DeMaria
Alberto Dent
Delbert H. DeSmet
Walter J. Desmond
Robert A. Fatjo
John D. Foley (with first honors)
William M. Gallagher, Jr.
Edward W. Greco
Charles Keenan
Peter S. Knego
Vivian Krag
Walter J. Kropp
Donald J. Lyons
Kenneth R. Malovos
Daniel L. McGloin
Lawrence H. Mouat
John J. Musso
Louis T. O'Callaghan
Marvin J. Owen
John J. Preston
Emmett J. Rinn
James J. Riordan
Alphonse G. Ruettgers
Salvadore M. Sanfilippo, Jr.
Bernard I. Sheerin
Philip I. Sheridan
Guido J. Simoni
Chester P. Stoddard
Charles F. Suver
Edgar M. Thrift
Joseph Roy Walsh
Russell M. White
Edward J. Zeman

* Cum laude.
** Magna cum laude.

EXTRAORDINARY PRIZES

1928

The Nobili Medal, for the student who shall be deemed first in morals, obedience and application to study, is awarded to Alvin Joseph Wolf, '28.

The Silver Medal for Conduct and Application, for the student in residence at the University distinguished for application and conduct, is awarded to Leonard Frederic Reeg, '28.

Distinguished: Redmond Allan Early, Fenton J. McKenna, John A. Spann, William I. Boland, Carl J. Leininger, Roderick A. Chisholm, Jr., George G. Gabel, Dan G. Bardin, Maurice J. Hoffman, J. Leo Quinn, Gerald E. Harrington, James H. Barr, Jr., Timothy P. Connolly, Joseph P. O'Connor, Arthur H. Kenny, Leroy J. Lounibos, Alberto Dent, Charles R. Heininger, George E. Vukota, George A. Sherman, John D. Mahoney, Walter M. McLaughlin.

The Silver Medal for Conduct and Application, for the student not resident at the University distinguished for application and conduct, is awarded to Robert Paul O'Brien, '28.

Distinguished: Joseph J. Deacon, Wayne H. O'Brien, George A. Martinelli, Clarence E. Newton, Paul J. Torelli, Napoleon J. Menard, John B. Morey, John D. Foley, Frank J. Somers, Charles H. Harvey.

The Archbishop's Medal for Christian Doctrine, valued at $50, for the student who shall have completed most successfully an examination in Christian Doctrine, is awarded to Leonard Frederic Reeg, '28.

Deserving Special Mention: William I. Boland, '28.

Distinguished: Arthur Quement, William C. Danielson, Gerald E. Harrington.

The Ryland Prizes for Debating, for excellence in the annual Ryland Debate between the Senate and the House, are awarded as follows: First Prize, $20, to Arthur H. Kenny, '30; Second Prize, $15, to Fenton J. McKenna, '28; Third Prize, $10, to John A. Spann, '28.

Distinguished: Leroy J. Lounibos, Thomas P. Ryan, Salvadore M. Sanfilippo, Jr.

The Owl Prize of $25 for the winner of the annual Oratorical Contest is awarded to Fenton John McKenna, '28.

Distinguished: John B. MacEnery, Victor L. Diepenbrock, Thomas P. Ryan.

The Orella Medal, valued at $25, for the writer of the best paper on a scientific subject, is awarded to Cyrus Henry LeBorgne, '28.

Distinguished: Thomas I. King, Edward W. Boland, William I. Boland.

The Redwood Prize of $15, given for the best essay on an historical subject, is awarded to Remo Nelson Cipolla, '30.

Distinguished: John B. Foley, James H. Barr., Jr., Edward W. Greco.

The William H. Leahy Prizes, for the best original dramatic compositions, are awarded as follows: First Prize, $25, to Allen G. McCauley, '29; Second Prize, $15, to John A. Spann, '28; Third Prize, $10, to John T. Healy, '31.

The Dramatic Art Prize, a watch, the gift of Mr. Louis R. Lurie, for the winner of the Dramatic Art Contest, is awarded to Fenton John McKenna, '28.

Deserving Special Mention: Wray H. Griffith, '30.

Distinguished: Salvadore M. Sanfilippo, Jr., Andrew J. Brennan, Arthur H. Kenny.

The Herman F. Budde Prize of $25 for the best paper in the final Examination in Senior Ethics is awarded to Victor Leo Diepenbrock, '28.

Distinguished: George A. Martinelli, Alvin J. Wolf, Robert P. O'Brien, Leonard F. Reeg.

The Italian Catholic Federation Prize of $25 for the honor student in the classes of Italian is awarded to Salvadore M. Sanfillippo, Jr., '30.

Distinguished: Peter A. Giannini, Elmo A. Cerruti, Edward W. Greco, James J. Scoppettone, Guido J. Simoni.

The Bancroft-Whitney Company of San Francisco offers a prize for the Senior honor student in the College of Law. This prize is awarded to Edward Preston Murphy, A. B. '27.

The American Law Book Company of Brooklyn, N. Y., offers a prize for the honor student in the course of Legal Research. This prize is awarded to Sisti Joseph Segretti, '29.

DONATIONS AND BENEFACTIONS

The President and Faculty of the University express gratitude for the following benefactions:

To Mrs. Agnes Graham for a sanctuary lamp and its perpetual endowment.

To Mr. H. Downie for an old Mexican painting of St. Aloysius and other relics.

To Mr. David O'Donnell for a number of valuable old books.

To Mrs. Lena McCuen for old coins and minerals.

To the Mrs. Theresa Dunne Estate for the sum of $4,500.00 towards the establishment of the M. C. Dunne Chair of Dramatics and Public Speaking.

To a friend for $25,000.00 towards the new library.

To Mr. Frank Schwabacher for a set of books on Engineering subjects.

To Mrs. Frances V. Morabito for a complete set of new missals for the Mission Church.

To the Hon. Arthur M. Free for ten volumes on International and Constitutional Law and the Federal Code.

To Mr. Victor A. Scheller for law books contributed to the Law Library.

To the Native Sons of the Golden West for a contribution of $360.00 towards the Mission Church.

To Mr. William H. Leahy and Mr. James Leahy for $1,000.00 towards the Mission Church.

To Mr. Victor Lemoge for four Dictographs.

To Mr. Henry A. Boivin for law books.

To the Hon. F. B. Brown for law books contributed to the Law Library.

To Prof. Lawrence H. Cook for magazines on Chemistry.

To the Hon. Arthur M. Free for bound volumes of the Congressional Record.

To the Native Daughters of the Golden West for $300.00 contributed to the Mission Church in honor of Father Edmund J. Ryan, S. J.

To Mr. Charles J. Welch for $1,761.23 towards the Library Fund.

To Mr. Charles J. Welch for $1,761.23 towards the Ricard Memorial Observatory.

To Mrs. Edward C. Lydon for a set of Engineering books.

To Mr. L. H. Nishkian, member of Am. Soc. C. E., for a copy of his work on "Moments in Restrained and Continuous Beams by the Method of Conjugate Points", contributed to the Engineering Library.

To Mr. M. P. Detels for $100.00 towards the Alumni Science Hall.

To El Monte Parlor No. 205, N. D. G. W., Mountain View, for $16.20 towards the Mission Church.

To Dr. Fred C. Gerlach, Dr. Edward Amaral, Dr. A. J. Baiocchi, Dr. John Gallwey, Dr. Alexander Keenan, Dr. Robert Peers, Dr. Charles J. Durand, Dr. Thomas O'Connor, Jr., Dr. O. D. Hamlin, Hon. C. C. Coolidge, Mr. Phil G. Sheehy, Mr. Peter F. Morettini, for professional services.

To His Grace Most Rev. Edward J. Hanna, D. D., for the Archbishop's Medal.

To Mr. Herman Budde for the Herman Budde Prize for 1929.

To Mr. William H. Leahy for prizes awarded for the best original dramatic composition.

To Mr. William F. Humphrey for the Dramatic Art Prize.

To the Italian Catholic Federation for a prize to the honor student in the course in Italian.

To Dr. Firmin R. Orella for the Orella Prize for 1929.

To Mr. Joseph Durney for the Barchi Prizes.

To the American Law Book Company for the annual prize to the honor student in the course in Legal Research.

To the Bancroft-Whitney Company for the annual prize for the Senior Law Student having the highest scholarship.

To Col. Joseph L. Donovan, U. S. A. (retired), Dean Emeritus of the College of Engineering, for his generous donation in the form of prizes for the College of Engineering.

To Mr. Andrew Mullen (deceased) for $500.00 contributed to the Mission Church.

To Mr. Rudolph J. Scholz for generous donations to the Alumni Science Hall.

To Mr. and Mrs. Philip I. Sheridan for a set of altar chimes for the Mission Church.

To the Hon. P. F. Gosbey for books on classical literature donated to the University Library.

To Prof. Fred C. Sauer for books donated to the University Library for use of students in the College of Business Administration.

To the following Alumni who have generously kept up their insurance policies in the interests of the University Endowment Fund:

Joseph Arbura
Reginald Archbold
James Bacigalupi
Archer Bowden
Richard Bressani
Roy Bronson
Dr. Joseph Richard Brown
Herman Budde
Leland Calice
Joseph G. Carey
Manuel Carrera
C. M. Castruccio
Clarence C. Coolidge
John A. Corotto
Herman Dieringer
Leopold Di Fiori
Paul Donlon
William Donovan
Maurice Dooling
Francis Dowd
George Kennedy
William Kieferdorf
Emil Larrouy
John G. Liebert
Marcel Lohse
Robert V. Lohse
Robert V. Lotz
William D. Lotz
Michael Maloney
Nicholas J. Martin
Jordan Martinelli
Robert E. McCabe
Henry McGowan
William McKinnon
Cornelius L. Monaghan
Peter Morettini
Edward Nicholson
Edward E. Nino
Thomas Feeney
Joseph Fitzpatrick
Charles Foley
John P. Foley
Byington Ford
Ignacio Forster
John Forster
Brian Gagan
Hugh Gallagher
Rev. James Galvin
George W. Geoghegan
Frank Hennessy
Joseph Hewitt
Fred Hoedt
John B. Hudner
William R. Jacobs
William E. Johnson
Dr. Alexander Keenan
Eugene Kelly
Joseph Kelly
Oliver G. Nino
Louis Normandin
Bernard J. Perry
Michael Plunkett
Joseph Rianda
Ray Rudolph
John B. Shea
Gerald Sheehy
Daniel Shellooe
Fred Sick
Orvis Speciale
Dr. George L. Sullivan
Timothy Sullivan
John H. Thompson
Dr. Joseph M. Toner
Chauncey Tramutolo
Leo Wagner
Elmer Westlake

John J. Wilson

REGISTER OF STUDENTS—~~1927-1928~~ 1928-1929

Abbreviations Used

Arts—College of Liberal Arts.
B. A.—College of Business Administration.
C. E.—Civil Engineering.
E. E.—Electrical Engineering.
Engr.—College of Engineering.
Fr.—Freshman.
Gr.—Graduate.
Jun.—Junior.
M. E.—Mechanical Engineering.
Premed.—Premedical Department.
Sem.—Seminary.
Sen.—Senior.
Soph.—Sophomore.
Spec.—Special, not in regular course.

Abate, Leo Joseph	Soph. Premed.	San Jose
Ackel, Lionel Rosalio	Soph. Premed.	Phoenix, Ariz.
Ahart, Warren Charles	Sen. B. A.	Marysville
Aiello, Valentine	Fr. B. A.	San Jose
Alcazar, Ramon, Jr.	Jun. B. A.	Celaya, Mexico
Alexander, Benjamin Franklin	Soph. Arts.	San Marino
Allegrini, Anthony Elio	Fr. Premed.	San Jose
Altenbach, Paul Francis	Fr. B. A.	San Jose
Ambrosini, Wesley Clarence	Fr. B. A.	Ferndale
Anglemier, Vernon Frank	Soph. Arts	San Jose
Aranda, Arichibaldo	Sen. C. E.	Leon, Mexico
Arnold, Shirley Theodore	Soph. Engr.	San Jose
Ascencion, Ruperto Pedoche	Fr. B. A. Spec.	Los Gatos
Auvil, Oscar F.	Fr. Sem.	Los Gatos
Axt, Milton Charles	Soph. Arts	San Francisco
Bagley, Philip Michael	Soph. Arts	Palo Alto
Bannan, Berchman A.	Sen. M. E.	San Francisco
Bardin, Dan Gordon	Sen. Arts, II Law	Salinas
Barr, James Holmes, Jr.	Jun. Arts	Yuba City
Barsi, George A.	Sen. B. A.	Stockton
Bartlett, Charles Lewis	Fr. Engr.	Port Townsend, Wash.
Belloli, William Joseph	Soph Engr.	San Jose
Berens, Norbert Henry	Fr. Arts	Summerfield, Kansas
Berg, Robert Ryland	Soph. Arts	Marysville
Berg, William Goodspeed	Fr. Arts	Marysville

Betkouski, Marcellian Richard	Jun. E. E.	Hollywood
Bigler, John Steedman	Soph. Arts	Santa Maria
Bigongiari, Romeo Joseph	Sopr. Engr.	San Jose
Bihn, Alphonsus Joseph	IV Law	San Jose
Bills, Joseph Paul	Fr. Arts	Long Beach
Bisordi, Charles Domenic	Fr. Engr.	Groveland
Blackinger, John Regan	Sen. Arts.	Boise, Idaho
Blethen, Howard Taylor, Jr.	Fr. Arts	Los Gatos
Bode, William James	Fr. B. A.	Salinas
Boiser, Maximino Cruzante	Fr. Arts	Los Gatos
Bonacina, Joseph Andrew	III Law	Arcata
Bonetti, Edward Raymond	Jun. Arts	San Jose
Boomer, Allen Taylor	Sen. B. A.	San Jose
Borchers, Charles Lester	Fr. B. A.	San Jose
Boucher, Ernest Joseph	Fr. Arts	Couer d'Alene, Idaho
Bouret, Emile John	Jun. B. A.	Los Gatos
Boyd, John Adams, Jr.	Fr. Premed	San Carlos
Bradley, John James	Soph. Arts	Vallejo
Breen, John Raymond	Sen. C. E.	San Francisco
Brennan, Andrew James	Soph. B. A.	San Jose
Brusher, Joseph S.	Soph. Sem.	Los Gatos
Bryner, Cyril	Soph. Arts	Menlo Park
Burrus, Ernest	Soph. Sem.	Los Gatos
Burszan, John, Jr.	Fr. Premed	San Mateo
Butler, John Kellogg, Jr.	Soph. B. A.	Honolulu, T. H.
Butler, William Howard	Sen. B. A.	Calistoga
Cahill, William J.	Soph. Sem.	Los Gatos
Callaghan, Leo Robert	Fr. Premed	Livermore
Campbell, William Robert	Jun. B. A.	San Jose
Campodonico, Angelo Joseph, Jr.	Soph. Premed	San Francisco
Caputo, Gregory Joseph	Fr. Arts	San Jose
Carew, Joseph Anthony, Jr.	Soph. Engr.	San Francisco
Carlston, Ellsworth Augustus	Fr. Arts	Ventura
Carlstroem, Charles Joseph	II Law Spec.	Palo Alto
Carmody, Robert J.	Soph. Sem.	Los Gatos
Caro, Frank Cardena	B. A. Spec.	Santa Clara
Carr, Francis Joseph	Fr. Arts	Redding
Carrese, Vincente J.	Jun. Arts	San Pedro
Casanova, John Eldred	Jun. Arts	Ferndale
Cassin, Robert Emmett	Fr. Arts	San Jose
Castro, Clarence Albert	Fr. Arts	Santa Clara
Ceccarelli, Dino Louis	Soph. Engr.	South Dos Palos
Cerruti, Elmo Adolph	Soph. Arts	San Jose

Chandler, Harold Maertens	Soph. Arts	Mountain View
Chargin, Ernest Ralph	Soph. Premed	San Jose
Chargin, Gerald Stephen	IV Law	San Jose
Chisholm, Kenneth Ignatius	Fr. Engr	San Francisco
Cicoletti, Theodore Oliver	Jun. Arts	San Jose
Cipolla, Remo Nelson	Jun. Arts	Santa Clara
Clark, Edward Joseph	Fr. Arts	San Francisco
Coit, Leonard Clarence	Fr. Arts	San Jose
Col, Eugene Edward	Jun. B. A.	San Jose
Cole, Millard Cunningham	Fr. B. A.	Roseville
Collins, John T.	Soph. Sem.	Los Gatos
Concannon, Patrick Thomas	Fr. B. A.	San Jose
Connolly, John Leonard	III Law	San Francisco
Connolly, Timothy Patrick	Jun. B. A.	Jerome, Arizona
Connors, James Joseph, Jr.	Soph. B. A.	Juneau, Alaska
Conway, Clemens E.	Fr. Sem.	Los Gatos
Coony, Charles R.	Fr. Sem.	Los Gatos
Corboline, Emile James	Fr. Arts	Sunnyvale
Corsiglia, Louis Willliam	Sen. Arts, II Law	San Jose
Covell, Eldon John	Soph. B. A.	Watsonville
Croal, Thomas Bernard, Jr.	Soph. Engr.	Las Vegas, Nevada
Crowley, George T.	Fr. Sem.	Los Gatos
Crowley, Wilfrid H.	Soph. Sem.	Los Gatos
Cummings, Edward Henry	Sen. Arts, II Law	Hollywood
Cummings, Edward John	Sen. Arts	Tehachapi
Cunningham, Frank Aloysius	Soph. Arts	Bisbee, Arizona
Daly, Thomas Emmett	Soph. B. A.	Jerome, Arizona
Damico, Chester Enrico, Jr.	Fr. Arts	Cupertino
Danielson, Robert John	Jun. Arts	Burlingame
Danielson, William C.	Soph. Arts	Burlingame
Davis, Donald Crance	Soph. B. A.	Pasadena
Day, Albert Eugene	Fr. B. A.	Santa Clara
Deasy, James J.	Fr. Sem.	Los Gatos
Deasy, John Gabriel	Soph. Engr.	San Francisco
Dellwig, Donald Louis	Jun. E. E.	San Jose
DeMaria, John Henry	Jun. Arts	San Francisco
Dent, Alberto	Jun. B. A.	San Jose, Costa Rica
Devine, Vincent James	Soph. Engr.	Moccasin
Deward, Ralph J.	Soph. Sem.	Los Gatos
Dias, Paul Joseph	IV Law	San Jose
Doetsch, Joseph Peter, Jr.	Soph. Engr.	Los Gatos
Donahue, Francis Charles	Soph. Engr.	Danville
Donnelly, James Bedford	Sen. Arts	Anderson

Donohue, Norman E.	Fr. Sem.	Los Gatos
Dowd, Edgar	Fr. Sem.	Los Gatos
Doyle, Richard Eugene, Jr.	Fr. Arts	San Francisco
Driscoll, Jerry Anthony	Fr. B. A.	Watsonville
Dulfer, Elbert Aloysius	Jun. Arts	San Francisco
Duncan, Wallace Blauth	Sen. C. E.	Sacramento
Dunlea, John Joseph, Jr.	Soph. Arts	San Francisco
Dunne, George H.	Soph. Sem.	Los Gatos
Duque, Andre Peter	Jun. Arts	Reno, Nevada
Duque, Bertrand Edmund	Jun. Arts	Reno, Nevada
Eames, James Patrick	Soph. Engr.	San Francisco
Eaton, John Smail	Soph. B. A.	Palo Alto
Eberhard, Jacob John	Jun. E. E.	Santa Clara
Eberhard, Thomas Francis	Fr. Engr.	Santa Clara
Ehlert, Stanley Charles	Soph. B. A.	Burlingame
Etchebarren, John Hughes, Jr.	Jun. B. A.	Reno, Nevada
Etchebarren, Peter Joseph	Soph. Arts	Reno, Nevada
Ethen, Joseph Louis	Fr. Arts	Palo Alto
Evoy, Martin G.	Fr. Sem.	Los Gatos
Faherty, John Maury	Jun. B. A.	Van Nuys
Falk, Charles Richard	Sen. B. A.	Los Angeles
Farrell, Thomas Francis	Soph. Engr.	San Francisco
Fatjo, Robert Joseph	Jun. B. A.	Santa Clara
Fawley, Norman Dick	Jun. Arts	Los Angeles
Finnegan, William J.	Soph. Sem.	Los Gatos
Fitzgerald, Ralph George	Sen. M. E.	Los Gatos
Flajole, Arthur J.	Fr. Sem.	Los Gatos
Flohr, Melvin Francis	Soph. B. A.	Petaluma
Flynn, Martin Joseph	Fr. Arts	Redwood City
Foley, Daniel Steven	Fr. Arts	Redwood City
Foley, John Dennis	Jun. Arts, I Law	San Jose
Foley, Philip Francis	Jun. B. A.	San Jose
Fontes, Joseph Albert	Fr. Arts	Irvington
Ford, Edward Thomas	Fr. B. A.	Bisbee, Ariz
Gabel, George Gerald	Sen. E. E.	Chico
Gaddy, Robert Joseph	Sen. Arts, II Law	Kelseyville
Gallagher, James	Soph. Arts	Fresno
Gallagher, William James, Jr.	Jun. Arts, I Law	San Francisco
Gallo, Fred John	Soph. Engr.	San Francisco
Gamma, John Antone	Soph. Engr.	Patterson
Geis, Louis B.	Fr. Sem.	Los Gatos
Giannini, Dante Henry	Fr. Arts	Santa Clara

Giannini, Peter Aloysius	Soph. Arts	Santa Clara
Gillick, Fred George	Fr. Premed.	Santa Clara
Gillis, John Duncan	Junior E. E.	San Francisco
Giovanetti, Edward John	Soph. Engr.	Juneau, Alaska
Giron, Felipe Antonio	Soph. Engr.	Guatemala, Guat.
Good, James Francis	Jun. Arts, I Law	Oroville
Gough, Jack Albert	Jun. Arts	San Francisco
Graham, Charles John	Fr. B. A.	San Francisco
Graham, Robert Malcolm	Sen. B. A.	Oakland
Granucci, Ernest Oliver	Soph. B. A.	Colma
Greco, Edward William	Jun. Arts, I Law	San Jose
Green, Arthur E.	Fr. Sem.	Los Gatos
Green, Joseph Murray	Soph. Arts	Phoenix, Ariz.
Griffith, Edward John	Sen. E. E.	Fresno
Griffith ,Wray Holman	Jun. Arts, I Law	San Francisco
Grossman, Russell Maurice	Jun. C. E.	San Jose
Haakinson, William Herbert, Jr.	Jun. Premed.	San Bernardino
Haas, Thomas Martin	Soph. B. A.	San Jose
Hafner, Wallace George	Soph. B. A.	Salinas
Hall, Donald George	Soph. Engr.	Santa Clara
Halstead, Jack Henry	Soph. Engr.	San Jose
Hamann, Anthony Peter	Fr. Arts	Orange
Hanley, William A.	Soph. Sem.	Los Gatos
Harper, Harold Patrick	Soph. Arts	San Jose
Harrington, Gerald Eugene	Sen. B. A.	San Francisco
Harrington, John Michael	Fr. B. A.	Butte, Montana
Hazel, Harry Charles, Jr.	Fr. Arts	Seattle, Wash.
Hazlewood, John Raymond	Jun. E. E.	San Francisco
Heagerty, Francis Joseph	Jun. Arts	Maricopa
Heagerty, Thomas James	Soph. Arts	Maricopa
Healy, John Timothy	Soph. Arts	Coronado
Herman, William Fred, Jr.	Sen. B. A.	San Jose
Hesser, John C.	Soph. Sem.	Los Gatos
Hillebrand, Francis Dennis	Fr. Engr.	Palo Alto
Hinderer, Victor F.	Fr. Sem.	Los Gatos
Hoffman, Maurice Joseph	Sen. M. E.	Los Angeles
Howell, Frank More, Jr.	Fr. Engr.	Los Altos
Hudner, Joseph John	Fr. Arts	San Juan Bautista
Huerta, Manuel	Jun. C. E.	Guadalajara, Mexico
Hulihan, John Ventre	Fr. Arts	Los Angeles
Hunter, Ian Bruce	III Law	San Jose

Ipina, Octavio	Fr. Engr.	San Luis Potosi, Mexico
Jahn, Henry M.	Soph. Sem.	Los Gatos
Jaqua, Norwood Edward	Soph. Arts	Pasadena
Jauregui, Edward G.	Fr. Arts	Reno, Nevada
Jauregui, John Adolph	Jun. Arts	Reno, Nevada
Jennings, James Joseph, Jr.	Jun. Arts, I Law	Sacramento
Karam, Nasib N.	Fr. Arts	Nogales, Arizona
Keenan, Edward J.	Fr. Sem.	Los Gatos
Keller, Winston Anderson	Fr. Arts	Martinez
Kenefick, Francis Owen	Soph. Engr.	Galt
Kenny, Arthur Hughes	Jun. Arts, I Law	Calistoga
Kerckhoff, Anton Philip	Jun. Premed.	Covina
Kern, Louis E.	Fr. Sem.	Los Gatos
Kilkenny, Thomas Edward	Fr. Arts	Dixon
Kirby, David Carroll	Soph. Arts	San Jose
Klatt, Francis Wellington	Soph. Arts	Santa Ana
Klaus, Jack Anthony	Soph. Arts	Berkeley
Knotts, George Ralph	Fr. Arts	Nipomo
Koller, Walter Francis	Sen. C. E.	Los Angeles
Lagan, Edward Jeremiah	Fr. Arts	San Francisco
Lanza, Joseph James	Fr. Arts	Tacoma, Wash.
Larkin, Thomas J.	Fr. Sem.	Los Gatos
Larrouy, George Pierre	Sen. Arts, II Law	Redwood City
Lawrence, William Henry	Soph. Arts	San Mateo
Leahy, Marshall Edmund	Soph. Arts	San Francisco
Leahy, Sherman Daniel	Soph. Arts	San Francisco
Ledden, Charles Thomas	Soph. Engr.	Mountain View
Lee, Martin Michael	Fr. B. A.	San Francisco
Lehr, Peter John	Fr. B. A.	Anaheim
Lemieux, Albert I.	Soph. Sem.	Los Gatos
Lemoge, Fay Joseph	Fr. Engr.	San Francisco
Leonard, William Patrick	Fr. B. A.	San Luis Obispo
LeSage, Wilfrid J.	Fr. Sem.	Los Gatos
Linares, Francis Joseph	Soph. B. A.	Panama, Rep. of Pan.
Lindsey, Bernard Marion	Fr. Engr.	Merced
Linehan, John T.	Soph. Sem.	Los Gatos
Logan, Joseph P.	Soph. Sem.	Los Gatos
Lonergan, Pierce Tobin, Jr.	Soph. Arts	Alameda
Long, George Louis	Fr. Arts	San Jose
Lounibos, LeRoy Joseph	Jun. Arts	Petaluma
Lubin, David	Fr. Arts	Sacramento
Luger, Joseph H.	Soph. Sem.	Los Gatos

Luoma, Henry Rudolph	Soph. B. A.	Berkeley
Lydon, Robert Emmet	Fr. Engr.	San Mateo
MacEnery, John Patrick	I Law Spec.	San Jose
MacGregor, Charles J.	Soph. Sem.	Los Gatos
Machado, Chris Stanley, Jr.	Soph. Arts	Salinas
Mahoney, John Chester	III Law	San Jose
Mahoney, John Daniel	Soph. B. A.	San Francisco
Mailhebuau, Marcel Eugene	Jun. B. A.	San Francisco
Malley, Edward Sarsfield	Sen. Arts, II Law	San Jose
Malovos, Andrew Joseph, Jr.	Soph. B. A.	San Jose
Malovos, Kenneth Richard	Jun. Arts, I Law	San Jose
Mancuso, Peter John	III Law	San Jose
Marks, David Jess	Jun. Arts, I Law	Bisbee, Arizona
Marshall, Clair A.	Fr. Sem.	Los Gatos
Martin, Gregory Thomas	Fr. Arts	Vallejo
Martin, John Albert	Jun. B. A.	San Jose
Martin, Joseph Lawrence	Fr. B. A.	Vallejo
Martin, William Savage	Soph. Arts	San Pedro
Martinelli, George Aloysius	III Law	Santa Clara
Martinelli, Savino Victor	Soph. Arts	Los Angeles
Mathews, Thomas Edward	Sen. Arts	Marysville
Mattos, George Ellsworth	Jun. E. E.	San Jose
McCaffery, Joseph Patrick	Jun. Arts, I Law	Chester, Pa.
McCarthy, Alan Lawrence	Fr. B. A.	Los Gatos
McCauley, Allen Gardiner	Sen. Arts, Premed.	Oakland
McCormick, James Graham	Jun. E. E.	Pescadero
McDonald, Cyril James	Soph. Premed.	Vallejo
McDonald, George Richard	Jun. Arts, I Law	Mountain View
McDonald, Leo B.	Fr. Sem.	Los Gatos
McHugh, Joseph I.	Fr. Sem.	Los Gatos
McKenna, Fenton John	III Law	Bisbee, Ariz.
McKeon, Alexander Ryan	Fr. Arts	Burbank
McLaughlin, Walter Morley	Soph. Arts	Sacramento
McMahon, Jacob Barrett	Sen. Arts, II Law	San Diego
McNabb, Paul V.	Soph. Sem.	Los Gatos
McNamee, Charles Francis, Jr.	Fr. B. A.	Hollister
McNeil, Arthur L.	Soph. Sem.	Los Gatos
McNulty, Edmund B.	Fr. Sem.	Los Gatos
Meckes, John G.	Soph. Sem.	Los Gatos
Menard, Napoleon Joseph	Sen. Arts, II Law	San Jose
Mettler, Herman Joseph	Soph. Engr.	Redwood City
Mignola, August Joseph, Jr.	Soph. B. A.	San Jose
Miller, Clarence Martin	Jun. Arts	Santa Clara

Miller, Paul Andrew	Soph. Arts	Salinas
Mitchell, Albert Joseph	Soph. Engr.	San Francisco
Morabito, Anthony James	Soph. Arts	San Francisco
Morabito, Carl Salvador	Soph. Arts	San Francisco
Moran, Edward Andrew	Soph. B. A.	Los Angeles
Morey, John Broggi	Sen. B. A.	Menlo Park
Morey, Joseph Philip	Fr. Arts	Menlo Park
Moroney, Harold Edward	Sen. B. A.	Vallejo
Murphy, Daniel Thomas	Jun. Arts	Phoenix, Ariz.
Murphy, Edward Preston	Gr. Arts	San Francisco
Murray, Douglas John	Fr. Engr.	San Francisco
Murray, Steven Kennedy	Soph. Arts	Esparto
Musso, John Joseph	Jun. B. A.	San Jose
Narvaez, Creelman Joseph	Soph. Arts	San Jose
Naughton, Michael Philip	Jun. Arts, I Law	Redlands
Naumes, William Joseph	Fr. B. A.	Hood River, Ore.
Nealen, Joseph P.	Fr. Sem.	Los Gatos
Nelson, William Albert	Fr. Arts	San Luis Obispo
Nichols, Francis Jerome	Fr. Engr.	San Mateo
Niles, William Elden	Fr. Arts	San Jose
Nogues, George Bohm	Soph. Engr.	San Jose
Noonan, Henry Louis	Fr. Arts	Vallejo
Noonan, James Ross	Fr. Premed.	Vallejo
Norboe, Paul Henry	Fr. Premed.	Sacramento
Normandin, Irving Louis	Soph. B. A.	San Jose
Novacovich, George George	Fr. Premed.	Watsonville
O'Brien, Jerold Monroe	Soph. Arts	San Jose
O'Brien, John T.	Fr. Sem.	Los Gatos
O'Brien, Paul W.	Soph. Sem.	Los Gatos
O'Brien, Wayne Henry	I Law	San Jose
O'Connor, Joseph Patrick	Jun. Premed.	Pasadena
O'Daniels, Howard Robert	Soph. B. A.	Seattle, Wash.
O'Daniels, Wallace Joseph	Soph. Arts	Seattle, Wash.
O'Donnell, Thomas Patrick	Soph. Arts	Hollister
O'Farrell, John J.	Soph. Sem.	Los Gatos
O'Hara, Albert R.	Fr. Sem.	Los Gatos
O'Hara, John J.	Soph. Sem.	Los Gatos
O'Hara, Thomas Francis	Sen. Arts, II Law	Vallejo
O'Keefe, James Thomas, Jr.	Soph. Arts	Menlo Park
O'Leary, Timothy J.	Fr. Sem.	Los Gatos
O'Mara, Cornelius J.	Soph. Sem.	Los Gatos
Ortuno, Thomas Albert	Fr. B. A.	San Jose, Costa Rica

O'Shea, Francis Vincent	Fr. Arts	Portland, Ore.
O'Sullivan, Carroll M.	Soph. Sem.	Los Gatos
Owen, Marvin James	Jun. Arts	San Jose
Owens, Vernon Herbert	Fr. Arts	Los Angeles
Oyer, Frank William	Fr. B. A.	Monterey
Parente, Frank Joseph	Soph. Arts	San Francisco
Parolik, Thaddeus J.	Fr. Sem.	Los Gatos
Parsons, Wellington Harry	Fr. B. A.	Gonzales
Patterson, James Holmes	Soph B. A.	Los Angeles
Payson, Stephen Henry	Soph. Engr.	Los Altos
Peake, Loami Palmer	Fr. Engr.	Santa Maria
Pecharich, John Philip	Fr. Engr.	Jerome, Ariz.
Pegg, Arthur Richard, Jr.	Fr. Engr.	San Pedro
Pereira, Efraim Emilio	Fr. Engr.	Barranquilla, Colombia
Peters, Ronald Francis	Soph. Arts	Danville
Pfister, Lawrence Joseph	Soph. B. A.	Los Angeles
Phelan, Donald Wilfred	Sen. Arts, II Law	Berros
Piper, George Paul	Soph. Engr.	Tacoma, Wash.
Pisano, Frank Edward	Jun. C. E.	San Jose
Porter, Arza Francis	Fr. Engr.	Arroyo Grande
Pontoni, Michael Severo	Sen. Arts, II Law	Arcata
Prag, Arthur Edwin	Jun. Arts, I Law	Portland, Ore.
Prindivillle, Gerald Andrew	Fr. Arts	San Jose
Puccinelli, Hector Philip	Jun. C. E.	San Francisco
Pugh, John Joseph	Jun. C. E.	San Francisco
Quement, Arthur	Jun. B. A.	San Jose
Quinn, John Leo	Sen. E. E.	Watsonville
Quinn, John Stanley	Sen. B. A.	Sacramento
Quinn, Thomas D'Arcy	Fr. Arts	San Francisco
Raggio, Albert Claude	Sen. B. A.	San Jose
Rains, Marvyn William	Fr. Arts	San Rafael
Raley, Walter, Jr.	Jun. Arts, I Law	San Jose
Ransford, James E.	Soph. Sem.	Los Gatos
Raven, Walter Francis	Sen. Arts	Shanghai, China
Reed, George Dugan	Soph. Arts	Petaluma
Regan, Joseph Dominic	Sen. M. E.	San Francisco
Regan, Myles Francis, Jr.	Jun. Arts	San Pedro
Reisner, Henry	Soph. Engr.	Los Angeles
Reiter, Joseph Miles	Fr. Arts	San Jose
Richards, Aaron	IV Law Spec.	San Jose
Riley, Bernard Patrick, Jr.	Soph. B. A.	Calipatria
Riley, Frederick Henry	Sen. E. E.	San Jose

Risso, Roland Rollin	Fr. Engr.	San Francisco
Roach, Charles Kenneth	Soph. B. A.	Oakland
Roll, John Robert	Fr. Engr.	San Jose
Ronstadt, Alfred	Soph. Arts	Tucson, Ariz.
Rooney, George M. G.	Soph. B. A.	Sacramento
Rowland, Alessandro Thomas	Soph. Arts	Los Angeles
Rudden, James Edward	Fr. Arts	San Francisco
Ruettgers, Alphonse Guy	Jun. B. A.	Wasco
Ruettgers, Francis Henry	Soph. B. A.	Wasco
Ruffo, Albert John	Soph. Engr.	Tacoma, Wash.
Ruiz, Jose Blas	Soph. Engr.	Santa Clara
Russell, Donald Albert	Soph. B. A.	Pond
Ryan, Harold F.	Fr. Sem.	Los Gatos
Ryan, Richard Emmett	Soph. Arts	Long Beach
Ryan, Thomas Patrick	Sen. Arts, II Law	San Jose
Saba, Joseph	Fr. Premed.	Nogales, Ariz.
Sanfilippo, Henry Patrick	Soph. Premed.	San Jose
Sanfilippo, Salvadore M., Jr.	Jun. Arts, I Law	San Jose
Santana, Fred Robert	Jun. Arts, I Law	San Jose
Santana, Joseph	Sen. Arts, I Law	San Leandro
Santoni, Mathew Octavius	Soph. B. A.	Woodland
Savio, Aldo Philip	Fr. Engr.	San Jose
Schelcher, George Joseph Jr.	Fr. Arts	Sacramento
Schenone, Joseph Anthony	Sen. Arts, III Law	Livermore
Schies, Clarence Emmett	Soph. B. A.	San Bernardino
Schimberg, Edgar Alexander	IV Law	San Jose
Schmid, Leo A.	Fr. Sem.	Los Gatos
Schmidt, Henry Frank G.	Jun. Arts	San Jose
Schneider, Clemens J.	Fr. Sem.	Los Gatos
Schuppert, Adam Frank	Jun. Arts	San Francisco
Scoppettone, James Joseph	Soph. Arts	San Jose
Scurich, Robert Stephen	Soph. Arts	Watsonville
Segretti, Sisti Joseph	Sen. Arts, II Law	Salinas
Selna, Theodore Louis	Jun. E. E.	Jerome, Ariz.
Shea, Albert John, Jr.	Sen. B. A.	Santa Rosa
Shea, John Francis	Sen. C. E.	Anaheim
Shea, Joseph M.	Soph. Engr.	Anaheim
Sheaff, Joseph Louis	Jun. Arts	Bakersfield
Shepardson, Jarrett Byron	Fr. B. A.	San Bernardino
Sheridan, Emmett Hugh	Jun. C. E.	San Jose
Sheridan, Philip Ignatius	Jun. Arts	San Francisco
Sheridan, Ralph John	Fr. Engr.	San Francisco

Sherman, George Anthony	Jun. E. E.	Livermore
Sidener, John Tyler	Jun. Arts	Orland
Sifferman, Karl Irvin, Jr.	Soph. Arts	Seattle, Wash.
Simoni, Guido Joseph	Jun. Arts	Salinas
Singewald, George Lawrence	Soph. B. A.	San Francisco
Smith, Arthur Almond	Soph. Arts	Palo Alto
Smith, Carl William	Soph. Arts	San Pedro
Smith, Charles Robert	Fr. Arts	San Jose
Smith, Miner Waddington	Fr. Engr.	San Jose
Snyder, William W.	Fr. Sem.	Los Gatos
Soldate, Lauren Frederick	Fr. Arts	Petaluma
Somers, Frank J.	Jun. E. E.	San Jose
Spotswood, Russell Elmer	Fr. Engr.	Pacific Grove
Steffani, Edward Cahalan	Soph. Engr.	Saratoga
Stenger, George Henry	Soph. Engr.	Cowell
Steward, Sidney Clay	Soph. Engr.	Redlands
Stockton, Robert	Fr. Premed.	Bakersfield
Stoddard, Chester Patrick	Jun. Arts	San Francisco
Stohsner, Ernst Ebert	Jun. C. E.	Santa Clara
Stretch, Edward M.	Soph. Sem.	Los Gatos
Stuart, James Lavaille, Jr.	Fr. Engr.	San Diego
Sugrue, Gerald A.	Soph. Sem.	Los Gatos
Sullivan, Harry Ignatius	Soph. Arts	Burlingame
Sullivan, John Ruger	II Law Spec.	San Jose
Sullivan, Leo Stanton	Fr. Arts	Ferndale
Susanj, Matthew Frank	Sen. C. E.	Santa Clara
Tagliaferri, Henry Alfred	Fr. Premed.	San Jose
Tapley, Stewart Boyd	Fr. Premed.	Marysville
Tassi, Albert Anthony	Soph. B. A.	Burlingame
Terremere, Albert Joseph, Jr.	Jun. Arts	Redwood City
Theller, William Wallace	Soph. Arts	Sunnyvale
Thomas, Joseph Weldon	Soph. Arts	San Diego
Thomas, Vincent	Fr. Arts	San Pedro
Thrift, Edgar Milton	Jun. Arts, I Law	San Jose
Tocalino George Lewis	Jun. B. A.	San Francisco
Tognazzini, Elmer Raymond	Soph. B. A.	San Luis Obispo
Tollini, Mario John	Soph. Arts	San Francisco
Toner, Ervin J.	Soph. Sem.	Los Gatos
Toohey, Constant Cornelius	Fr. B. A.	Lindsay
Torelli, Paul Joseph	II Law	Santa Clara
Towne, Robert John	Soph. Arts	Salinas
Tuite, Thomas Joseph	Fr. Arts	Redwood City
Twohy, James Francis, Jr.	Fr. Arts	Portland, Ore.

Urueta, Enrique	Fr. Engr.	Barranquilla, Columbia
Vachon, Hayden A.	Soph. Sem.	Los Gatos
Valine, Anthony Michael	Sen. B. A.	Santa Cruz
Vasconcellos, Augustine Crane	Fr. Premed.	Santa Clara
Vazquez, Manuel I.	Fr. Engr.	San Jose, Costa Rica
Verzi, John Robert	Jun. B. A.	Santa Clara
Volio, Arthur, Jr.	Fr. Arts	Cartago, Costa Rica
Von Tobel, Jacob Edward	Fr. B. A.	Las Vegas, Nev.
Vredenburg, Paul Lawrence	Soph. Engr.	San Francisco
Vukota, George William	Jun. M. E.	Livermore
Wagner ,William F.	Fr. Premed.	San Francisco
Wald, Clifford Joseph	Fr. Premed.	Santa Clara
Wallace, John Anthony	Fr. Engr.	Modesto
Walsh, Joseph Roy	Jun. Arts, I Law	Reno, Nev.
Wanger, Alfred Leo	Soph. Arts	Vallejo
Warren, William Joseph	Soph. Engr.	Arcata
Weber, John A.	Fr. Sem.	Los Gatos
Welch, John Howard	Soph. Arts	Los Angeles
Weller, William M.	Fr. Sem.	Los Gatos
Wharton, Arthur S.	Soph. Sem.	Los Gatos
Wilkinson, Joseph Kerr	Fr. Arts	Pomona
Williams, John Augustus	Fr. Arts	Arroyo Grande
Wirtz, Cable Ambrose	Fr. Arts	Honolulu, Hawaii
Wolf, Theodore	Soph. Sem.	Los Gatos
Zabala, William Edwin	Soph. Arts	Salinas
Zapp, Carl Philip	Fr. Arts	Seattle, Wash.
Zerwekh, Edward Stanton, Jr.	Fr. Arts	San Pedro